The Mining Journal

Established 1835

Railway & Commercial Gazette

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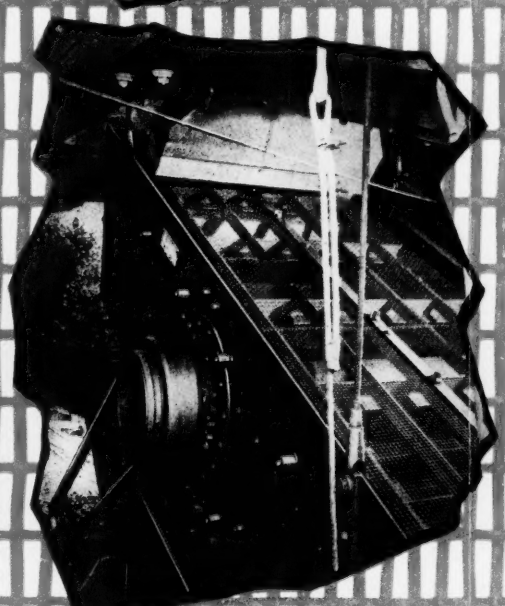
NYLON HOSIERY LOOKS WELL— WEARS WELL



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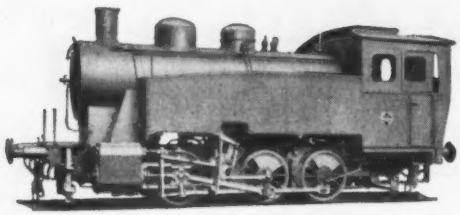

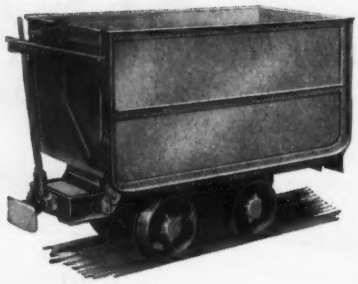

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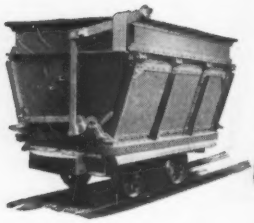

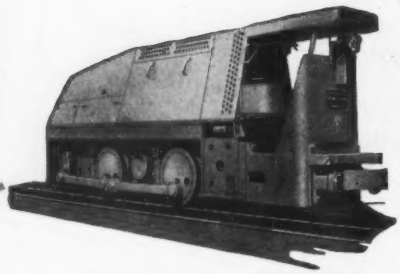

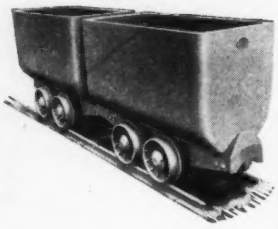

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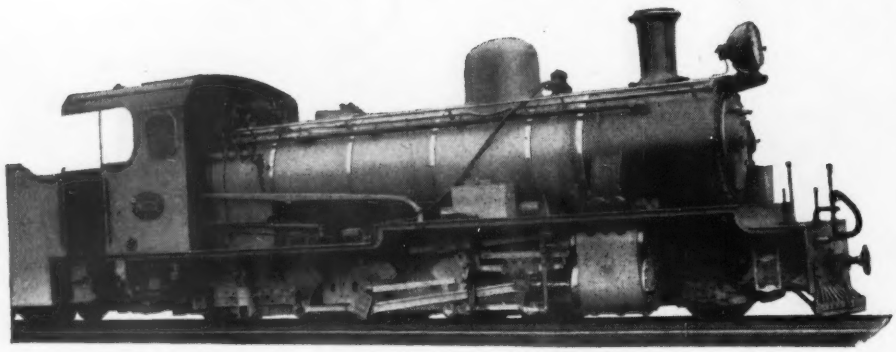

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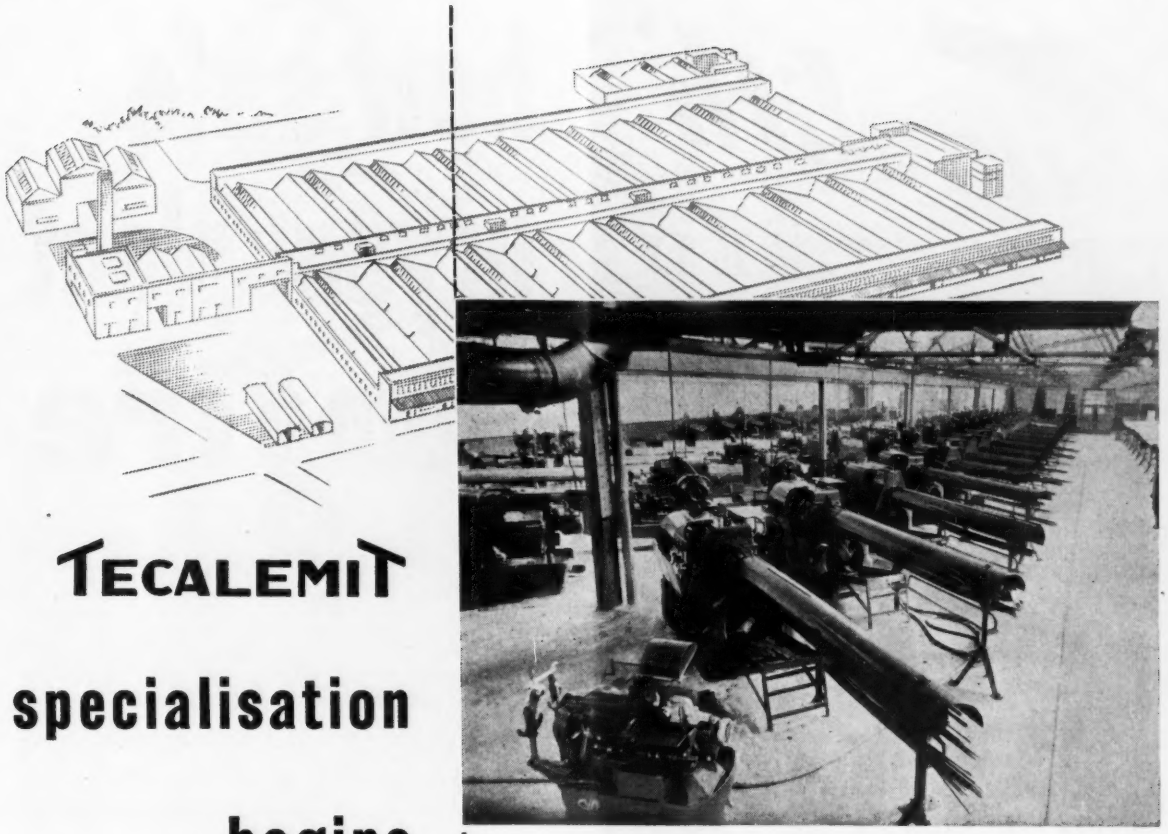

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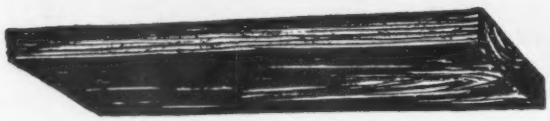

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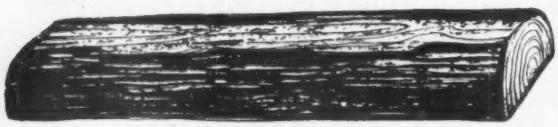

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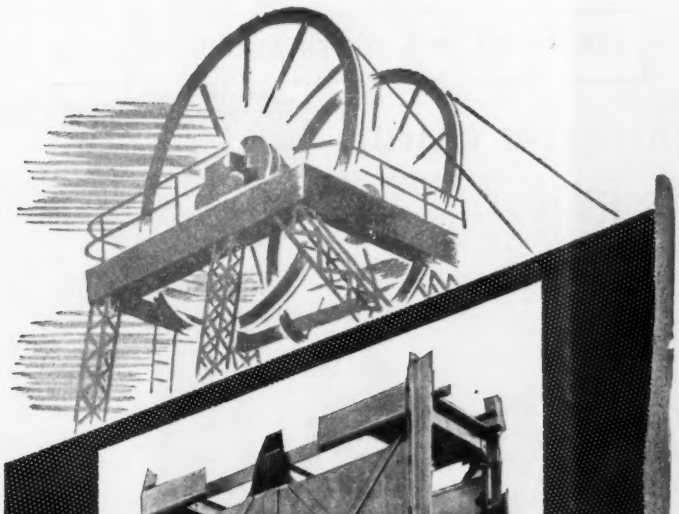

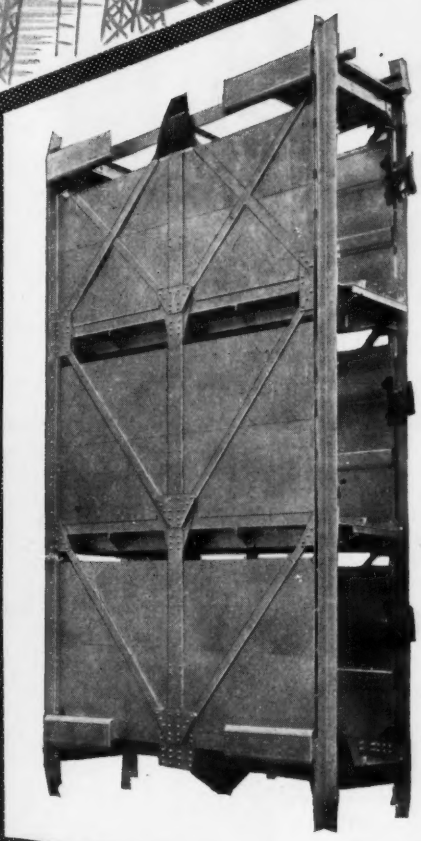

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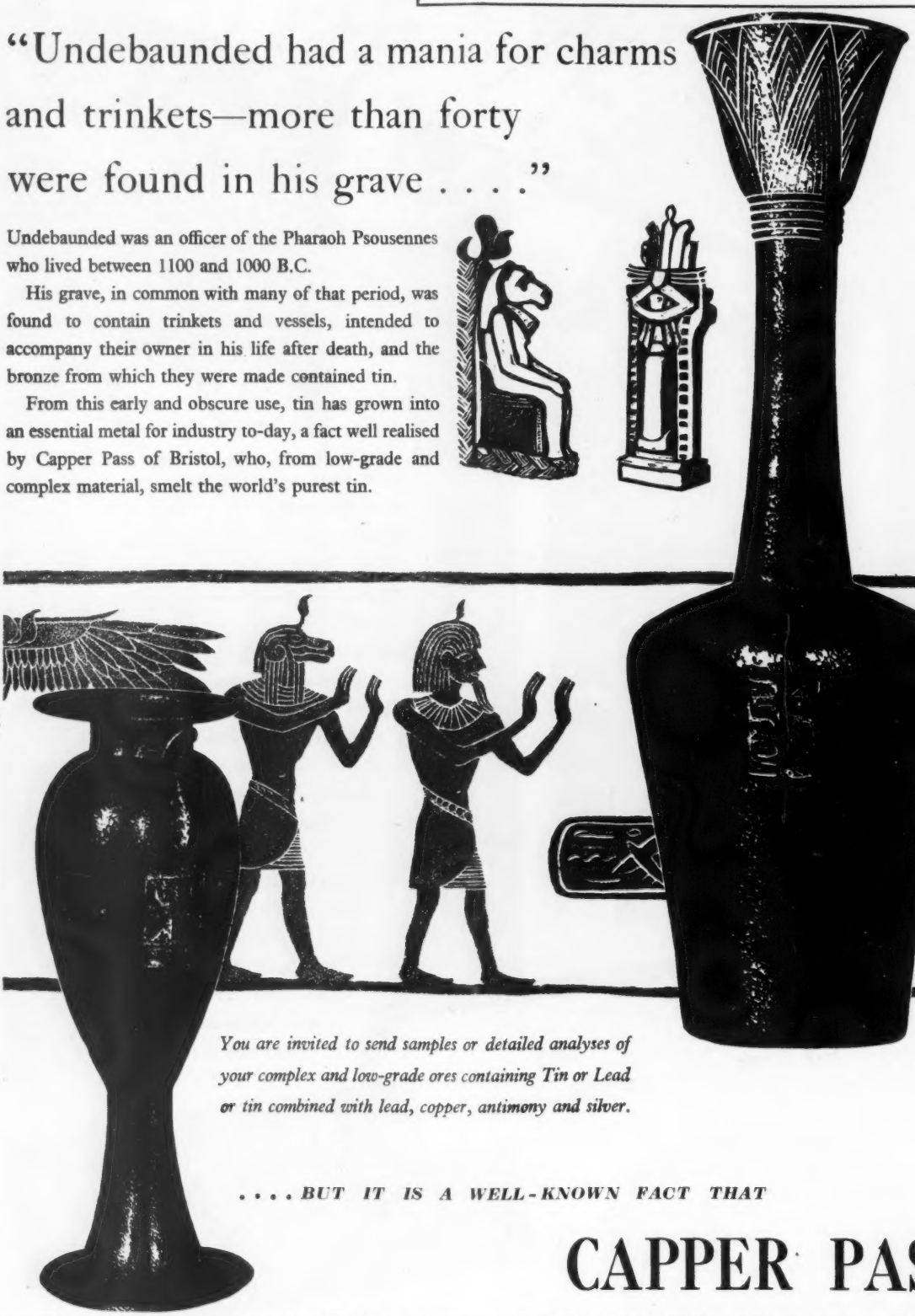
LITTLE KNOWN FACTS ABOUT TIN: NO. 3

"Undebaunded had a mania for charms and trinkets—more than forty were found in his grave . . . ."



Undebaunded was an officer of the Pharaoh Psousennes who lived between 1100 and 1000 B.C.

His grave, in common with many of that period, was found to contain trinkets and vessels, intended to accompany their owner in his life after death, and the bronze from which they were made contained tin.

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Established 1835

Vol. CCXLII No. 6195 **LONDON, MAY 14, 1954** **PRICE 8d**

CONTENTS

Notes and Comments	573	**The Mining Markets**	584
From Our Own Correspondent Brazil, Western United States.	574	**Company News and Views**	585
Refractory Materials in South Africa	576	**Company Meetings and Announcements** African and European Investment Co. Ltd; Gold Coast Selection Trust, Ltd.; Marlu Gold Mining Areas, Ltd.; Konongo Gold Mines, Ltd.; Consolidated Murchison (Transvaal) Goldfields and Development Co. Ltd.	587
A Development Record in Tanganyika	578		
Raw Materials for Aluminium Production	579		
Machinery and Equipment	581		
Metals, Minerals and Alloys	582		

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NOTES AND COMMENTS

The Philippines in 1953

Mining in the Philippines presents a very chequered history over the past 25 years. In the more immediate pre-war period this industry made rapid progress, especially in gold mining in which an output of 1,144,332 f.oz. was attained in 1941. Then came the Japanese invasion and occupation, at the end of which mining had practically ceased, with the gold output only 297 f.oz. in 1946 and a total value for all mineral products of P.3,997,035. Since then production in all branches has steadily improved with the aggregate value last year of P.145,833,393, of which gold with a total of 480,625 f.oz. was responsible for roughly 35 per cent. However, something of a check to the advance was experienced last year as there was but a slight advance on the 1952 total aggregate value of P.144,314,529.

Passing to glance at individual productions Benguet Consolidated was the largest gold producer with 102,109 oz. besides 84,000 oz. of silver; Balatok yielded 88,654 oz. gold and 73,146 oz. silver; San Mauricio followed with 55,894 oz. gold and 68,521 oz. silver; Surigao Consolidated came next with 57,861 oz. gold and 61,614 oz. silver; Lepanto Consolidated returned 46,139 oz. gold but had much the largest silver output—179,370 oz. There were a number of smaller producers, including the placer workings of Coco Grove, Nor-Min Ventures and Surigao Placer.

In the base mineral section, Consolidated Mines was responsible for the entire output of refractory chromite, 468,549 tonnes, and Acoje Mining for the bulk of the metallurgical grade with 75,200 tonnes. Lepanto Consolidated produced 12,233 tonnes out of a total of 12,715 tonnes of metallic copper. Surigao Consolidated and San Mauricio accounted for practically the whole of the 2,434 tonnes of lead metal produced as well as a token output of zinc, 747 tonnes. There were numerous small producers of manganese ore, the chief being General Base Metals with 13,281 tonnes out of a total output of 21,508 tonnes.

The check to the rapid advance in production since the end of the war is no doubt due in part to the general world fall in prices experienced in 1953 and to the uncertainty regarding the future world demand and price levels. In pre-war days Japan offered a ready and contiguous market for the base metals and minerals, but it looks as though financial stringency may restrict her influence as a purchaser and confine her largely to barter trading. However, as an article in our issue of April 16 last shows, there is an intensive movement through the Republic towards prospecting the largely unknown potentialities of the islands, concentrating more on development and installing new plant and so increasing output capacity.

Kafue Preferred to Kariba

That no change was contemplated in the Federal Government's decision to carry on with the Kafue hydro-electric power scheme as the first major development undertaken by the Central African Federation was made known at the end of last week in a statement by Sir Roy Welensky, the Acting Prime Minister of the Central African Federation. The statement by Sir Roy was made in response to a speech in the Southern Rhodesian Territorial Parliament by Mr. Garfield Todd, the Southern Rhodesian Prime Minister, who claimed that, on the basis of new data received, it may be better to proceed with the larger and more costly Kariba Gorge scheme.

Sir Roy Welensky's statement will be welcomed by the Copperbelt companies and the Northern Rhodesian Government, whose future revenues depend so largely on the rapidity with which additional power can be made available to meet the expanding needs of the Copperbelt companies.

Sterling Convertibility Desired by Malayan Tin Smelters

The sooner fully convertible sterling became available the better it would be for the Malayan tin-smelting industry, declared Sir Ewen Fergusson, chairman of the Straits Trading Company, in his review to shareholders at the annual meeting of the company held earlier this week.

Malayan smelters, he continued, provided a service to the mining industry unequalled anywhere in the world, and it was, therefore, disappointing to see ore supplies from Siam shipped to other destinations via Malaya because currency could be obtained which was more attractive for conducting business transactions than sterling. Sir Edwin hoped that the recent steps towards the freeing of sterling by the U.K. Government were but steps towards the termination of exchange control.

As a practical illustration of his argument, he said that following the decision to close the Texas smelter there were indications that more tin ore might become available from

Siam but owing to exchange control regulations virtually no variation had occurred in the tonnage handled by Malayan smelters.

Turning to the U.S. stockpile, Sir Ewen said that the recent American decision to continue to purchase supplies for this purpose, coupled with the assurance that they would not be placed on the market, had been of great value, as it had removed uncertainty and had given breathing space for discussions on the Geneva Tin Agreement. But his view was that the proposed agreement operated more in favour of the consumer than the producer. Under the proposed agreement producers had undertaken to carry a stock of 25,000 tons of tin metal, thereby contracting a heavy financial burden which, in some measure, relieved the consumer of the normal task of ensuring his own supplies through the usual market channel. The producers' case was that they hoped to provide stability and abundant supplies within reasonable price fluctuations.

Portuguese Mining and the Korean War

A study of the effects of World War II when viewed in the light of mining conditions in Portugal during the Korean War makes an interesting comparison that is brought out in a recent letter from our Portuguese correspondent. Did the Korean emergency benefit Portugal? Broadly speaking it can be said that the State benefited but that with few exceptions the mining industry did not. The "wolfram complex" which took possession of Portugal during the World War was by no means extinct when the Korean trouble blew up. The word "wolfram" has become a sort of infallible remedy for every economic difficulty—a means of becoming rich without any major effort. This complex, when related to later conditions, failed to realize that whereas in the war period after the middle of 1942, everything found an outlet at a fixed price paid by the Portuguese Government, under the later conditions the consumer fixed the price on a fluctuating basis. Another result of the early conditions was the number of super-ambitious schemes for long term contracts introduced by persons knowing very little about the commercial and far less about the technical side of mineral trade. Though these adventures were fully publicized in the foreign press the influence of the complex is still felt as holders of stocks will not sell at to-day's prices in the expectation of a rise.

The question of repeal of the taxation imposed on all exports of tungsten and cassiterite ores was brought up in the National Assembly recently when the attention of the Minister of National Economy was called to the following points. It was claimed that export taxes were illegal and as a result Portugal could not hope to compete with other producing countries. That about 100,000 workers earn their living from the mining industry, that the capital invested in the mineral industry is very considerable, and that serious social and economic trouble will be the result if the mines remain closed.

It was further pointed out that both production and export from Spain, usually 200 per cent behind Portugal, was now well ahead. Finally, the complete and immediate revision of all mining taxation was a matter of urgency.

The points are well taken. Portugal could have doubled exports of cassiterite but for the restrictions and difficulties hampering exporters. These restrictions no doubt aim at preventing certain materials reaching destinations where trading ideas do not tally with those of the Atlantic Pact countries. A step that might have relieved regular exporters would have been the formation of an Exporters' Guild by which the legion of undesirables which brought such discredit on the trade in World War II, and repeated that performance in the Korean War, would have been excluded. This is a Corporative State and such a measure could have been easily arranged.

Brazil

(From Our Own Correspondent)

Teresopolis, April 7.

The relative importance of the various non-ferrous minerals to Brazilian economy is well illustrated in the new classification of imports. Merchandise has been re-grouped according to the degree of essentiality and a large number of products have been included in Category 2, to which 35 per cent of the available exchange, instead of 25 per cent, has been allotted. Minimum prices are unaltered (see *The Mining Journal*, December 4, 1953), but Category 1, the most favoured group, now includes copper, lead, zinc and tin ores and concentrate and tinplate.

Category 2 includes amianthus or asbestos; high-grade graphite; pulverized mica; fluorspar; copper, tin, lead, aluminium, zinc and nickel scrap; bulk palladium; industrial platinum, silver, iridium, osmium, rhodium and ruthenium, except for jewellery; copper, tin, aluminium, lead and zinc ingots, etc., and alloys; nickel, molybdenum and magnesium and alloys; other metals and metalloides, except pure mercury.

Category 3 includes tungsten and wolfram; special copper tubes; copper and aluminium cables.

Category 4 includes copper, aluminium, lead and zinc sheet, rods, shapes, etc.; copper and aluminium tubes.

METALS RESERVES

According to figures published by *Engenharia, Mineraçao e Metalurgia*, Brazil exported 1,754,966 tonnes of primary mineral products in 1952 and imported 8,253,664 tonnes. Imports of copper in various forms totalled 21,552 tonnes, copper alloys 4,027, zinc 10,431, nickel 183, lead 10,158, tin 1,241, and aluminium 10,159. All these are produced locally, but in insufficient quantities for the growing needs of the home market, despite the progress made in the last few years and the official assistance given to private enterprise. The position as regards copper was described in *The Mining Journal* of September 26, 1952.

Zinc occurs in the form of blende in the Morro do Bule mine at Ouro Preto, Minas Geraes; as willemite and calamine, or Smithsonite, at Ribeira do Iguape, São Paulo, and Furnas, with 17 per cent Zn.; and as willemite at Januaria, Minas Geraes. Professor Mehl recommends examining the known deposits, and prospecting for others, in South São Paulo, extending investigations later to Januaria.

Brazil's reserves of nickel are estimated at 20,000,000 tonnes, with an average of 2 per cent metallic nickel. The most important deposits are in Goias, at Niquelandia, formerly known as São João de Tocantins, where a Canadian company is about to start mining operations.

Lead ores are widely distributed over Brazil, from Pará, in the north, to Santa Catarina in the south. They usually contain galena, pyrite and sphalerite and secondary minerals, such as cerussite, anglesite and calamine. The proved reserves of the Ribeira Valley, São Paulo, are in the order of 200,000 tonnes, with a 20 per cent content, but potential reserves are believed to be much greater. The panella deposits, in Paraná, which are an extension of the above, contain 300,000 tonnes, and a detailed study of this region has been suggested, with aerial surveys, followed by systematic drilling and tunnelling. Although at least 120 lead deposits are known to exist in Brazil, local mines still contribute only 2,000 tonnes annually towards market requirements, which are estimated at 23,000.

The position as regards aluminium and tin was described in *The Mining Journal* of February 2, 1952, and February 12, 1954, respectively.

Western United States

(From Our Own Correspondent)

Portland, Oregon, April 26.

Any exultation that C.I.O. Steelworkers may have felt over the recent secession of three Butte locals from Mine, Mill and Smelter Workers' Union and their application to affiliate with Steelworkers (*The Mining Journal*, March 19, 1954) was short lived as Mine-Mill recently won an N.L.R.B. election in Butte by a vote of almost two to one and thus gains official recognition as the sole bargaining agency for the district. This is a severe blow to Steelworkers which had hoped to gain control of all non-ferrous unions.

GOLD AND SILVER

Gold miners have won the second round in their fight for damages caused by the enforced shutdown in October, 1942, by War Production Board Order L-208. First round was when the Court of Claims overruled a motion by government attorneys to dismiss the cases and ordered that they should be heard. Second round was when the Court ruled on March 31, 1954, that seven of the nine petitioners had in fact been damaged by the order. The decision was a finding of fact only and the next step will be for the mines to prove that the federal government is liable. If successful in this they must then show to what extent the mines were damaged individually.

Homestake reports 1953 production as $18,251,984 from 1,368,059 tons of ore, an average of $13.34 per ton. Metallurgical recovery was 96.66 per cent. A more adequate labour supply and a modification of stoping methods effected an increase in tonnage of 8 per cent over 1952. Homestake has completed extensive remodelling of its crushing and grinding plant, including an entire elimination of stamps which have always been part of the flow sheet since the first mill was built 75 years ago. The new design effects a material saving in power and steel consumption.

At the Summit King mine, north of Tonopah, Nevada, stoping has commenced after years of exploration and development revealed high-grade gold and silver ore on what is supposed to be the northerly extension of the Tonopah ore zone. The property is owned by Calumet and Hecla and is being operated under lease by American Smelting and Refining Co. and Summit King Mines, a subsidiary of Bralorne of Canada.

DEVELOPMENTS IN THE BASE METALS INDUSTRY

Reports still come in regarding the closing of this or that lead or zinc mine. This depressing news is somewhat alleviated by other information, notably from the Coeur d'Alene district, of development and exploration carried on during the period of reduced production, and Camp Bird in the San Juan district in Colorado reports that in spite of adverse conditions it increased production during 1953. Meanwhile announcement of an increase in the stockpiling programme for lead and zinc offers some encouragement although there are some who doubt the wisdom of this as a long range programme. Report of the Tariff Commission is being awaited anxiously and the industry is hopeful that it will recommend an increase in lead and zinc tariffs, in which case a lively battle before Congress is in the offing.

Eureka Corporation (Ventures Ltd.), which has been in the news quite often because of water troubles at its Fad shaft, has commenced sinking a new shaft to develop the orebodies demonstrated by diamond drilling a mile north of the Fad and above the latter's water horizon. The new shaft will be square, of four compartments, and will be carried to the 1,150 ft. level. A balanced average of four cores from this ground showed 6½ ft. (not representing the width of the vein) assaying .38 oz. gold, 18.48 oz. silver, 22.1 per cent lead, 1.5 per cent zinc. As a contrast between the old and the new it is of interest to note that years ago U.S. Smelting operated the Richmond-Eureka mine, now the nucleus of Eureka Corporation's holdings, because the ore afforded a basic flux with sufficient gold to defray cost of mining and shipping to its Utah smelter. Now at the Cortez mine in the same vicinity mill tailings are being shipped to the International smelter in Utah for their value as a siliceous flux and their silver content.

THE IRON-ALLOY METALS

American Chrome Co., operating in Stillwater County, Montana, has attained rated production of 380 tons of concentrates averaging 38 per cent Cr_2O_3 from 1,000 tons of crude ore daily. The company is under contract with the government to furnish 900,000 tons of concentrate over a period of eight years. Calera Mining Co. (Howe Sound) has increased production of cobalt ore at its Blackbird mine in Idaho from 200 to 600 tons per day. Production was cut back about a year ago because of operating difficulties at the newly constructed refinery at Garfield, Utah, the first plant to use the Chemico process on a commercial scale. Production to date approximates 295 tons of cobalt metal.

H. M. and S. Milling Co. at Salt Lake City is processing a 30,000 ton stockpile of tungsten ore left when the Metals Reserve refinery at that point was abandoned after World War II and is also treating custom ore. Concentrate is sold to the nearby refinery of the Salt Lake Tungsten Co. which produces tungstic acid. Concentrates as low as 5 per cent WO_3 are accepted.

URANIUM AND THE COLORADO PLATEAU

A.E.C. report for the last half of 1953 states that more than 525 uranium mines are operating in the country, most of them in the Colorado Plateau region. Nine processing plants are in operation and a tenth is under construction. During the past three years a sum in excess of $3,000,000 has been paid in bonuses for production from newly discovered deposits to 338 properties in the Plateau region. The Commission has extended to February 28, 1957, the date for payment of such bonuses and has extended its minimum price guarantees to March 31, 1962. Six Coeur d'Alene mining companies have formed a coalition for exploration and development of uranium deposits in the Big Indian district in south-east Utah, at least until conditions in the zinc-lead industry improve. Texas City Chemicals Inc. is now recovering uranium concentrates as a by-product of treatment of phosphate rock shipped from Florida. The process was mentioned without details in the 1953 Annual Review number.

A UNIQUE SERVICE

Contract Milling Co. of Spokane, Washington, is instituting a unique service. When a mine is in the development stage so that capacity and flow sheet of a mill are yet to be determined this company will install a semi-fabricated plant of up to 125 tons capacity with minimum cost to the mine and treat the ores on a contract basis until a suitable flow sheet is developed and a permanent mill appears justified.

Western Phosphate Inc., owned jointly by Kennecott, A. S. and R., and Stauffer Chemical Co. of San Francisco, has commenced full scale operation of its plant at Garfield, Utah. The plant has an annual capacity of 92,000 tons of phosphates and processes rock from Idaho and Montana.

Refractory Materials in South Africa

Spectacular success has been achieved in South Africa during recent years in the processing and development of raw refractory materials. Deposits of refractories of all types are extensive in the areas concerned and are generally of good quality, with the result that an industry of wide possible potential is being established. The following article gives a brief description of the refractory metals at present being exploited in South Africa, and notes their geographical situation and standard of texture.

In recent years the Union of South Africa has made spectacular progress in the processing of minerals which formerly were exploited solely or mainly for export. Particularly impressive has been the success achieved in developing and turning to account the great variety of raw refractory materials with which the country has been endowed. Fireclays are found in every province, the best known occurrences being those at Boksburg, Olifantsfontein and Vereeniging in the Transvaal. Siliceous and high-alumina materials are also abundant and there are extensive deposits of chromite, vermiculite, magnesite, kieselguhr, and dolomite.

EXLOITATION OF FIRECLAY

The manufacture of firebricks is one of the oldest manufacturing industries in the Transvaal, for there is evidence that it was first established at Vereeniging as long ago as 1894. It was not till 1937, however, when amorphous silica bricks were produced for the first time by the Vereeniging Brick and Tile Co. Ltd. that the manufacture of refractories began to receive special attention. During the second world war the expansion of the steel and engineering industries was reflected by a corresponding increase in the consumption of refractories. At the same time copper producers in Northern Rhodesia and the Belgian Congo, cut off from their former sources of supply, became dependent on the Union for their essential requirements of refractories.

To keep pace with the rapidly increasing demand, the Consolidated Rand Brick, Pottery and Lime Co. Ltd., at Olifantsfontein, and the Vereeniging Brick and Tile Co. Ltd., extended the capacities of their plants and their range of production, with the result that to-day both companies are among the largest manufacturers of refractories in the Southern Hemisphere.

The Union's fireclays vary considerably in composition but possess high refractory properties. Bricks of the required grade and quality are produced by blending different clays. In the manufacturing process the bricks can be given the physical qualities required for a particular service.

DEVELOPMENTS IN SILICA BRICK MANUFACTURE

Formerly all silica bricks were made from selected quartzite from the Southern Transvaal, those used in the South African iron and steel industry being in some instances superior to imported bricks. Nowadays the use of this material is confined to the production of gas and coke oven bricks. The severe conditions of open hearth furnaces, electric furnaces and Bessemer converters require super-duty bricks of the greatest possible density. This has led to the development of bricks based on silenetes found in the Mossel Bay and Riversdale districts of the Cape Province.

A quality specification issued by the South African Bureau of Standards covers a silica brick which shall contain in the fired state not less than 94.5 per cent of silica or 94.5 per cent of silica plus titana, the silica then to be not less than 92 per cent. The specification also covers fireclay refractories classified according to resistance to heat as super duty, high heat duty, and normal high heat duty.

In the third quarter of 1953 380 tons of silica were exported to the United Kingdom and total exports of silcrete amounted to 2,600 tons.

HIGH-ALUMINA REFRACTORY MATERIALS

Refractory products belonging to the aluminous group are classed as high alumina refractories if they contain 50 per cent or more of alumina. The raw materials used in the Union for manufacturing this class of brick are andalusite, corundum, sillimanite and kyanite. So far as South Africa is concerned, by far the most important of these materials is andalusite.

South African andalusite is of the same chemical composition as Indian kyanite (Al_2O_3 62.85 per cent, SiO_2 37.15 per cent), but differs in its physical properties. It has the advantage that it can be used in its raw state as a refractory, whereas both kyanite and sillimanite have first to be precalcined.

Many occurrences of andalusite have been found in the Union, but only two are considered to be of economic importance. Of these the more valuable is in the Marico district of the Transvaal, where large exposures of andalusite-bearing slates have been found. Ages of erosion have concentrated the andalusite in the river valleys traversing the rock, and rich deposits of andalusite-bearing sands several feet thick and extending long distances have been discovered. While the quantity of andalusite available cannot be accurately estimated, the opinion has been expressed that there must be at least 10,000,000 to 15,000,000 tons.

CLEANING BY MAGNETIC SEPARATION

Difficulties were experienced initially in cleaning the mineral, but these have been overcome through the extraction of foreign bodies by magnetic separation. It was found that if the coarsest and finest grades were removed by sieving some of the impurities could be extracted with little or no loss of good andalusite, large fractions of the remaining impurities then being removed by pneumatic concentration followed by magnetic separation. The prepared product contains crystals of andalusite ranging in size from $\frac{1}{8}$ to 1/50 of an in. Beneficiation in a heavy media sink and float plant has also been introduced.

Bricks capable of standing a temperature of 3,500 deg. F. are manufactured from South African andalusite. Because of its hardness—little inferior to that of natural corundum—this material is also an excellent abrasive.

Sillimanite is found between the Zoutpansberg mountains and the Limpopo river. The individual occurrences are small and much of the material is mixed with detrimental impurities difficult to separate from the ore. Some excellent material has nevertheless been obtained. There are also occurrences of sillimanite in Namaqualand and the mineral is produced on a limted scale in South-West Africa. Kyanite is found in small quantities in various parts of the Union.

Last year the South African production of andalusite and sillimanite aggregated 11,772 s.tons, the proportion of the latter mineral probably being in the region of 20 per cent. Exports amounted to 3,034 s.tons with an f.o.b. value of £30,960. Almost half the output of grain andalusite is exported to the United Kingdom.

Bricks have been made at Olifantsfontein from Transvaal corundum and experiments have been made with sillimanite-corundum mixtures.

CHROME-MAGNESITE BRICKS

Chrome and chrome-magnesite bricks are manufactured from materials obtained in South Africa or Southern Rhodesia. The Union is one of the world's largest producers of chromite, but the bulk of the output is used in the chemical industry, for which a friable ore is required. Most of the Transvaal ore is of this type. For refractory purposes a hard, lumpy type is mainly used, but there is also a considerable outlet for the friable material in chromite bricks and in cements for patching and protecting furnaces. Supplies of refractory grade material are limited.

The chrome ore deposits of the Transvaal are among the largest in the world. They have been traced for 170 miles of strike and are both thick and regular. The dips are low and the deposits continue in depth. Apart from the recovery of a certain amount of ore by surface stripping along the outcrops, the chromite is mined at shallow depths, either from level adits or from inclined shafts. The thickness of the chrome seam is often around 40 in. and provides an adequate stoping width. Occasionally small blobs of country rock occur within the chromitite seams. Where such contamination takes place the hard, lumpy ore can still be sorted out by hand, but the "sands" have to be cleaned mechanically and a fair amount of success has been achieved in this direction. The cost of mining is generally low, the most important considerations—apart from the grade of ore—being transport and accessibility. The chromite is generally low to medium in grade, but material with about 50 per cent Cr_2O_3 is exported as washed or concentrated ore.

For statistical purposes no distinction is made between metallurgical, refractory and chemical grades, classification being solely on the basis of chromium oxide content. Production during 1953 comprised 336,104 tons of ore with a chromium oxide content of 44 per cent or under, 397,296 tons having 44-48 per cent Cr_2O_3, and 65,167 tons of ore with a Cr_2O_3 content of 48 per cent higher. Exports totalled 579,315 tons valued at £2,692,019.

Magnesite of a high degree of purity occurs in the eastern Transvaal. The most important deposits lie in the Jamestown intrusive rocks of the Barberton district. The magnesite is of good quality and breaks cleanly and readily from the country rock. The occurrences form irregular networks of veins of dense magnesite varying in width from mere films up to 4 ft., the mineral usually being contaminated with minute quantities of other material. Similar deposits occur in the Klein Letaba district of the northern Transvaal, where pure white magnesite of an extraordinary hardness is present. Last year 25,229 tons of magnesite were produced, the entire output being locally consumed.

In the production of refractory bricks magnesite is first sintered at an extremely high temperature and is then crushed and ground into various sizes, which are blended to give the maximum density. The bricks are dried and fired to a temperature of not less than 1,500 deg. C.

A company known as Rhodesian Refractories Ltd. was recently formed jointly by Vereeniging Brick and Tile Co. Ltd. and Consolidated Rand Brick, Pottery and Lime Co. to mine and sinter magnesite in Southern Rhodesia.

KIESELGUHR AND DOLOMITE

Kieselguhr or diatomite is of widespread occurrence in South Africa and is extensively used in the manufacture of refractories, producing insulating bricks of high quality. Being formed by the deposition and accumulation of siliceous remains, this material is extremely light and porous, and it has the additional advantage of being fireproof.

All the South African deposits are of recent origin and occur in the beds of existing marshes and pans or in those that have recently dried up. In many places deposition is still taking place. The kieselguhr is seldom free from impurities, which are not always objectionable. Clay when present in small proportions is sometimes advantageous, since it acts as a binding material.

Most of the kieselguhr produced in the Union has come from a deposit on a farm about 35 miles east of Ermelo, which has been worked intermittently since 1913. The deposit lies in the bed of an oval reed-covered vlei about one-third of a mile wide and three-quarters of a mile long. When dug up, the kieselguhr is a black, peaty material containing as much as 80 per cent confined moisture and organic matter. It is sacked and air-dried and is either sold in this form or calcined by igniting the air-dried material. The final calcined product is a white or grayish-white powder containing between 87 and 97 per cent of silica. A production of 120 tons was recorded for 1953.

South African steelworks use rammed dolomite in the bottom of open hearth furnaces. It is claimed that dolomite base linings, if over 15 in. thick, can safely be rammed directly on fireclay bricks in less than half the time required to burn in an all-magnesite bottom. The Union has abundant resources of dolomite.

VERMICULITE PRODUCTION

The opening up of immense deposits of vermiculite in the Transvaal has provided the Commonwealth with a material of great value for refractory purposes. From an initial output of 215 tons in 1938 production has been expanded to 33,844 tons last year. With exports totalling 34,324 tons and having an f.o.b. value of £200,602, the Union was by far the largest shipper of this material.

South African vermiculite has a fusion point of 1,350 deg. C., while the temperature at which it starts to sinter and undergo contraction is 1,238 deg. C. Ceramically bonded vermiculite bricks have proved to be highly efficient insulating materials, having a slightly higher safe working temperature than kieselguhr, with which they compare very favourably in other respects. A disadvantage of kieselguhr is that if it is heated much over 950 deg. C. the cell structure breaks down with consequent very drastic shrinkage.

In certain circumstances the use of vermiculite offers advantages in hot face insulation, which might be described as replacing the solid firebrick as a lining material with porous lightweight insulating bricks. The advantages obtained are low conductivity and low thermal storage. As a result, a furnace can be raised to working temperature in a fraction of the time normally required because the lining is not absorbing any appreciable proportion of the heat input. Hot face insulation bricks are being manufactured in Britain from South African vermiculite.

Another form in which vermiculite is used in the metallurgical industries is in a concrete made by mixing it with *ciment fondu* or even Portland cement. Such concretes can be used for casting insulating rafts beneath furnaces and for certain furnace parts which must be cast *in situ*.

The production of vermiculite in South Africa is now virtually confined to the Transvaal Ore Company in the Palabora district. This company is re-organizing its mining methods and renovating machinery and its prospects for further expansion appear to be very favourable. The company's sole agents in London are Mandoval Ltd. (formerly Mineral and Overseas Agencies Ltd.).

A Development Record in Tanganyika

By J. SPALDING, A.R.S.M., B.Sc., M.I.M.M., M.C.M.M.S.S.A.

The following description of the development work done by Union Corporation in 1953 on their small mine, Prospect 14, in Tanganyika, completely refutes allegations as to the scarcity of supplies and the inability of local labour in the area. The author is mining consultant to the governments of Tanganyika and Uganda, and this article illustrates the possibility of establishing record footages by use of good management and organization. The article is published by permission of Union Corporation Limited.

Prospect 14 is one of a number of mineral occurrences found by Union Corporation in Western Tanganyika. It lies in bush country about 30 miles beyond the Mpanda lead mine to which a railway has recently been constructed. A dirt road, which becomes impassable in very wet weather, connects the mine to the railhead.

The occurrence is a shear zone, mineralized sporadically with lead, copper, gold and silver. Mineral was revealed over a very considerable strike length, by trenching and by two small shafts put down to the water table at 130 ft. depth. The gangue consists of quartz, barytes, siderite, and portions of the sheared containing rock.

The minerals were completely oxidized down to the water table, so it was decided to deepen the No. 1 shaft to the 250 ft. horizon and to drive 1,000 ft. each way at this level, together with crosscuts at 100 ft. intervals to test the shear. By personally visiting the main supply centres in East Africa the manager was able to obtain all the plant he required, namely a small generating set, an electric hoist, sinking pumps with a capacity of 18,000 gallons an hour, etc. The equipment was installed and the shaft was deepened to the required depth. Much water was encountered and the ground in places was so bad that the distance between sets had to be reduced from 66 to 32 in. The shaft has three compartments, each 4 ft. square inside timbers.

As soon as development was started at the 250 ft. level water was struck in greater quantities than could be held. The workings had to be abandoned and the electric pumps were only just got out in time. The shaft filled rapidly up to the water table.

Extra generating plant was obtained and larger sinking pumps were flown up from South Africa. As a result of this rapid service the shaft was dewatered and access obtained to the level in less than a month after it had been lost. The amount of water then making was 30,000 gallons an hour.

EARLY DEVELOPMENT

Drives were started out north and south, working three shifts, but owing to water troubles and bad ground the average footage gained was only 7 ft. a day each side. Work was on the task system, and each shift was usually able to complete its task in under six hours. The intervening two hours were necessary in order to blow out the fumes from blasting.

At first the mineralized portion of the shear was followed, but although the 250 ft. horizon was definitely in the sulphide zone, the ground in that portion of the shear was so water-logged and rotten that it was later decided to keep the drives on lines away from the mineral, and to test for the latter by crosscuts at 100 ft. intervals.

A fan having been obtained, an African was employed to make ventilation pipes. This man was an ex-manufacturer of the muzzle-loading guns which are permitted to the Africans of Tanganyika with which to shoot game. He designed and made his own jigs, and proceeded to roll ventilation pipes out of 8 ft. by 4 ft. sheets of 18-gauge galvanized iron.

These pipes were laid to within 120 ft. of the faces, and the fan was installed at surface, exhausting from the system. Joints were made airtight with Laykold. The fan was a Sirocco No. 5 and was driven at 1,400 r.p.m. by an electric motor.

The rigid pipes were further extended by canvas pipes, and near the faces 12 in. air-driven fans were installed blowing back into them. With this equipment the re-entry period was reduced to 20 min.

INCENTIVES FOR LABOUR

For reasons not connected with this account speed in completing the development programme was of primary importance. The work required was entirely exploratory, and so it was decided to keep the headings as small as possible and not to install tracks or cars, but to use rubber-tyred wheelbarrows. Since each of the three shifts had shown itself able to complete its task in under 6 hrs., and owing to the improved ventilation, a fourth shift was put on. The men were allowed to leave the mine the moment their task was finished.

This was the secret of the success of the operation. The African likes to work for as short a time as possible, and will make enormous efforts if he realizes that by so doing he can reduce that time to a minimum. He can at times be persuaded to work hard by bonuses paid on the amount accomplished, but having made a little extra money in this way he is then very prone to take time off until he is again hard up.

In fact, to get off shift early is to the African by far the strongest incentive to working hard. He is also easily inspired by competition, and much can be done by provoking a spirit of rivalry between gangs or between shifts. The operation was planned to take advantage of these characteristics and as a result the footage obtained was doubled. The organization by which this was attained is described later, and it resulted in the two ends being advanced a total distance of 1,744 ft. in 59 working days, at the end of which period the development programme had been completed. This figure is the sum of driving and crosscutting.

For driving in bad ground, for clearing with wheelbarrows, and for using East African labourers who had not been underground till a few months before, this is probably a record.

ORGANIZATION

Each of the four shifts contained a European shift boss, a drilling gang, and a mucking gang. The total African strength of each shift was 23 men, but if there were any spare men available one or two extras were sent down as learners so that in the event of a man being absent, his replacement would not be completely raw.

When the men went on shift they found one end clean and the other just blasted. The drillers drilled over the clean end and blasted it, while the muckers cleared the other. They then changed round and the muckers went into the end just blasted, while the drillers drilled their second round in the other drive.

As soon as the shift boss saw that the end of his task was approaching he telephoned to the surface. Drums were sounded in the camp, and the relieving shift came on immediately, was checked over, and proceeded underground by the time the shift being relieved had finished. In this way as many as four and a half shifts were obtained in a day, representing nine faces drilled over, blasted and cleaned in succession.

Each shift had to complete six shifts in the week. If things went badly the work occasionally ran on into Sunday morning, but this seldom happened. More usually the 24 shifts were completed some time during Saturday, in which case a seventh day's work was arranged and the gangs were paid accordingly.

During the period in which this system operated there were no troubles with staff or labour, and a keen competitive spirit was built up between gangs. There was very little absenteeism and the few loafers were soon sorted out by their fellow workers themselves. The Africans employed were mostly of the Wafipa tribe, with some Warungwa ; the senior Africans were Wawemba who had had previous experience underground in Northern Rhodesia.

DRILLING OPERATIONS

The drilling gang consisted of one driller and four helpers. They were responsible for all work in connection with drilling, including the carriage of drill steel, repairs to hoses, and similar tasks.

The drives were kept small, 6 ft. by 6 ft. as a maximum, so only one rockdrill was used in an end. Spare machines were kept available nearby in case of breakdown. P. and M. bits were used on $\frac{7}{8}$ in. hollow steel rods, the longest rods being $4\frac{1}{2}$ ft. The air, water and ventilation pipes were extended on Sundays after all shifts were finished.

At times there were alternative faces available each side, the main drive and a crosscut face. This was of great assistance when it became necessary to timber right up to the face. The gradient of the drives was kept at 1 in 150.

Trouble was experienced with water throughout the programme ; frequently it emerged from the drill holes under pressure. During the development period described the amount of water pumped averaged 20,000 gallons an hr.

FACE CLEARANCE

The mucking gangs consisted of a headman, two station muckers, 12 wheelbarrow men and three face muckers. When the gang entered a face the face men, who were picked out as the best men in the gang, immediately threw back all the muck along the last 12 ft. of one wall of the drive. This allowed three wheelbarrows to enter and be filled at one time. By this means also the headman was able to get access to the face and to have it barred down ready for drilling by the time the pile was cleared.

It was found difficult to maintain side drains, so the water was allowed to flow down the centre of the drives, and the rubber-tyred wheelbarrows splashed through it. The drives were electrically lit from the shaft as close to the faces as possible. Without this lighting the footage achieved would have been impossible. At the completion of the programme the working faces were over 1,000 ft. from the shaft.

Work at such high pressure could not have been kept up for an extended period, but for a limited programme of development such as that described it was ideal. The fact that the camp was surrounded by dense bush for 20 miles in every direction was no deterent, in fact it was probably a helping factor. The staff all lived together in a mess, they had no outside relaxation other than hunting for game, and so they literally lived for their work.

Raw Materials for Aluminium Production

To ensure domestic production of aluminium for essential civilian and defence uses, the U.S. government recently promoted a programme designed to double the production capacity of primary aluminium over that existing in 1949. In view of this vastly increased production, which has developed under the authority of the Defence Production Act of 1950, the U.S. Bureau of Mines has discussed the raw materials of aluminium production in *Information Circular* 7675, by D. D. Blue, assistant chief of the Light Metals Branch, Minerals Division, from which the following article is condensed. The materials discussed in the paper are limited to those that are consumed in the production processes only, and structural, electrical and chemical equipment are not mentioned. The materials are discussed in the order in which they are required in the production cycle.

The consumption of aluminium is increasing rapidly, and during the decade from 1939 to 1949, years most nearly comparable from the standpoint of economic and political conditions, the calculated quantity of aluminium consumed by United States industry, excluding plant scrap and stocks held at fabricating plants, increased five-fold, from 234,000 tons to 1,159,000. The use of aluminium in materials of defence and attack is well known, and the trend toward increasing proportions of lightweight airborne and highly mobile ordnance equipment will continue in future to accentuate the demand for wartime aluminium. To ensure domestic production of aluminium for essential civilian and defence uses the U.S. Government, under authority of the Defense Production Act of 1950, programmed and promoted an expansion programme that will more than double the production capacity that existed in 1949. When the programme, as planned at the end of 1952, is completed, the estimated annual capacity of the United States primary aluminium producers will exceed 1,700,000 tons. In view of this vastly increased production capacity, it is interesting to review the raw materials, both with respect to quantity and sources, required for this production programme.

Three commercial alumina-extraction processes were used in the United States in 1952, and there were differences in raw material requirements for each type of domestic plant. Until World War II alumina was obtain by the American Bayer process developed to extract alumina from gibbsitic bauxite (gibbsite is $Al_2O_3\ 3H_2O$) by a caustic soda solution. In this process, chemically combined silica in the ore unites with alumina and soda to form an insoluble, zeolitic-type compound that is discarded with resultant decrease in alumina recovery and loss of valuable soda. During World War II when shipments of bauxite from South America were curtailed by enemy action and an increased consumption of domestic bauxite with a relatively high silica content was necessary, a new process known as the combination process, so named because it was a combination of the Bayer process and a lime-soda sinter process, came into commercial use. The sintering step was also called the red-mud process and was employed to treat residues from the Bayer leach for recovery of additional alumina and soda. In this process limestone is sintered with leach residues to form an insoluble dicalcium silicate, and soda and alumina are leached out and returned to the

Bayer circuit. Late in 1952 the United States began using bauxite from Jamaica. This ore had a high iron content and contained boehmite (Al_2O_3 H_2O), which is less soluble than gibbsite in the soda extraction. To treat this ore a third process, called the modified Bayer process, was inaugurated in which higher extraction temperatures and a modified technique for separation of the pregnant liquor from the residue is used.

Aluminium is the most abundant metal element in the earth's crust, but up to the present time virtually all of the metal has been produced from bauxite. The term "bauxite" has been applied to the richest naturally occurring materials, which consist mainly of hydrated aluminium oxides. Most of the aluminium found in the earth's crust occurs in chemical combination with silica, as in clays and anhydrous aluminous rocks. However, recovery of alumina from bauxite is less complex and less expensive than from the aluminium silicate materials. From the point of view of highest alumina recovery coupled with the least complicated extraction technique, bauxite low in silica and with the alumina present as the trihydrate is desirable.

All domestic U.S. bauxite used in alumina production at the end of 1952 was treated in combination process plants. Ores of varying silica content were processed, and the output or capacity of a combination plant was a function of the silica content of the bauxite. In practice bauxite containing as high as 20 to 25 per cent SiO_2 was mined and blended with ore to a lower silica content to give a feed material of the desired composition. It is obvious that greater quantities of bauxite would be required per ton of alumina because of the lower alumina content of high-silica ore.

MATERIALS FOR ALUMINA PRODUCTION

Other materials consumed in the production of alumina are soda ash, lime and limestone, starch, filter cloth, fuel, and, of course, water and labour. The following table is based on the industrial average in 1951 and requirement forecasts of 1952.

Raw material requirements per ton of alumina

Bauxite	1.8	long dry tons
Soda Ash	208	lb.
Lime	175	lb.
Starch	2.4	lb.
Fuel (natural gas)	12.4	M.c.f.
Filter Cloth	.61	yd.
Labour	2.7	m.hrs.

The soda ash used in alumina production is continuously re-cycled, and the consumption represents make-up to replace soda lost in process, largely in leach residues. In the Bayer processes soda is discarded as an insoluble sodium aluminium silicate, and in the combination process soda is discarded with the insoluble dicalcium silicate, which, although carrying lower percentage of soda than the Bayer residue, is of considerably greater bulk per unit of alumina recovered. In any of the processes, soda ash consumption is a function of silica content, and, although this consumption is lower per unit of contained silica for the combination process, the requirements per unit of alumina may be as great. Soda ash losses averaged about 280 lb. per ton of alumina production, equivalent to 530 lb. per ton of aluminium.

Lime is consumed in the production of alumina for causticizing the sodium carbonate in extract liquors, and limestone is used to form dicalcium silicate in the sinter step of the combination process. For causticizing, an average of 175 lb. of lime was used to produce 1 ton of alumina, or 330 lb. per ton of primary metal. In the combination process the limestone consumption is a function of the silica content of the treated bauxite. Between 2 and 2.2 moles of lime is required for each mole of silica in the sinter amounting to 10 to 11 weight units of limestone for each 3 unit weight of silica. For bauxite containing 13 per cent silica, calculated limestone requirements are equal in weight to the alumina product.

Actual limestone requirements were less than the calculated amounts.

Other requirements, fuel, filter cloth, starch, and labour, are of interest because of the difference in requirements among the three types of plants. Available information shows the fuel requirements are 2½ to 3 times greater for the combination process than for the Bayer processes; labour requirements double. Filter-cloth requirements are about 10 per cent greater. Starch requirements are reported to be much higher for treatment of Jamaican ores.

THE REDUCTION PROCESS

The major material requirements for reduction of alumina to metal are alumina, power, carbon, and flux or electrolyte materials. In producing 1 ton of aluminium, 1.9 tons of alumina was consumed. As the industry was organized in 1952, all of the alumina consumed at reduction plants was produced by the consuming or an affiliated company.

The electrical energy consumed in the production of aluminium is generally quoted at 10 kW.-hr. per lb. of metal. This requirement may be about right when all of the electrical requirements from mining, through alumina extraction to production of virgin metal are accounted for, however, the power consumed at reduction plants averaged approximately 8.5 kW.-hr. per lb. of aluminium.

The selection of locations for reduction plants has been governed largely by the availability of low-cost power.

Raw material requirements per ton of virgin aluminium

Alumina	3,825	lb.
Power	17,000	kW.-hr.
Carbon (total)	1,385	lb.
Green petroleum coke	250	,,
Calcined petroleum coke	780	,,
Pitch, high softening temp. (105°-115°C.)	180	,,
Pitch, low softening temp. (40°-70°C.)	125	,,
Coke or calcined anthracite	50	,,
Electrolyte, equivalent F_2 weight	65	,,
Cryolite	47	,,
Aluminum fluoride	58	,,
CaF_2 equivalent*	148	,,
H_2SO_4 equivalent†	203	,,
Labour	26	m.hrs.

*Cryolite x 1.23 + AlF_3 x 1.55. †CaF_2 x 1.37.

Most of the carbon used in aluminium production is consumed as anodes at the electrolytic cell. These anodes must be of high purity because ash from the electrode enters the electrolyte and contaminates the electrolyte and the metal. Carbon is also required for the cathode or cell lining, which deteriorates and periodic replacement is necessary.

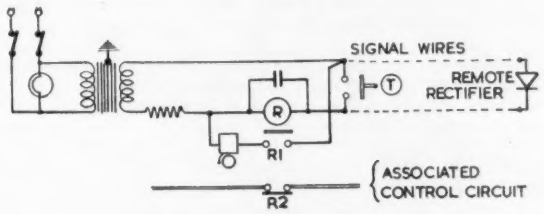
The basic electrolyte or flux material is cryolite, Na_3AlF_6. However, the determination of raw materials required for electrolytes is complex because of the substitution of synthetic for naturally occurring cryolite and the use of AlF_3 as a partial replacement. As the molten flux disassociates and is consumed in the reduction process, various salts are added to the bath to keep it at a uniform composition and density. Cryolite is supplied as a naturally occurring mineral and as a synthetic product, which was produced by reacting HF with sodium aluminate liquors.

The labour requirements for aluminium production are somewhat unique because of the high power consumption per man-hour of electrical power consumption.

MACHINERY AND EQUIPMENT

A New Signalling System

The "SB" Signalling System, manufactured by Hugh Wood and Co. Ltd., has been designed for use on A.C. circuits and offers the advantage of a neat and inexpensive layout. The system can be used on either bare wire or insulated systems and can operate to the length of approximately three miles (150 ohms lead and return). Incoming and through going sealing glands are available for the A.C. supply circuit and up to five glands can be provided on the intrinsically safe side and these features greatly increase adaptability.



A schematic diagram of the system showing energized condition, at normal

The flameproof enclosure is designed to B.S.229-1946, and Buxton certified flameproof under Certificate FLP. 3145, Group 1. The signalling transformer complies with B.S. 1838-1949, and can be supplied for 110 or 240 volt A.C. supplies. The complete system is certified intrinsically safe under Ministry of Fuel and Power Certificate No. T/BR/161. Two H.R.C. fuses, and indicator lamp and a double pole "Off" switch are all fitted on the primary side of the transformer. A special twin P.O. type 3000 relay for bell ringing and control circuit interlocking is used. A remote rectifier is supplied in a suitable enclosure with two $\frac{3}{8}$ in. B.S.F. terminals.

The secondary winding of the transformer is connected in series with a relay coil (R) and a half wave rectifier at the remote end of the system, making a closed circuit. A condenser is shunted across the relay (R) for instrinsic safety purposes and to assist the coil during the blocked half cycle. Short circuiting of the signal wires cuts the half wave rectifier out of circuit and allows A.C. to flow through the relay which reduces the effective magnetic flux and allows the relay armature to drop out, and contacts R1 close to ring the bell whilst contacts R2 opens the control circuit of the associate apparatus. The S.B. system does not prevent the transmission of normal code signals when the haulage or conveyor is at rest.

Gauge and Tool Exhibition

The fourth of the series of exhibitions organized by the Gauge and Tool Makers' Association since January, 1946, will open at the New Hall, Vincent Square, London, from May 17 to 28. The classes of products on display will be gauges and measuring equipment, jigs, fixtures and special tools, press tools, special purpose machines, engineers' small tools, portable power tools, moulds and dies, and diamond tools. The gauge and tool industry serves the industrial field of general industry and engineering and has definite applications within the mining industry.

Among the exhibitors this year are London and Scandinavian Metallurgical Co. Ltd. on Stand No. 77. The tool department of this company operates as a separate unit, having a modern toolroom fully equipped for the production of all types of precision moulds and dies, and facilities exist also for the manufacture of jigs and fixtures. On the stand sample cavities will be exhibited, as well as mouldings.

On Stand No. 50, L. M. Van Moppes and Sons (Diamond Tools) Ltd., will exhibit Diatrue single point wheel truing tools, and also a wide range of diamond tools for the truing, forming and manufacture of abrasive wheels.

For the mining engineer a representative selection of Diadril rock bits and reaming shells will be shown. In association with Toolmasters Ltd. on Stand No. 65, an extended range of Diaform wheel forming attachments will be on view.

Pipeline in Netherlands New Guinea

The completion last month of the largest oil pipeline in Netherlands New Guinea has connected the jungle-surrounded oilfields of Wasian and Mogoi with the coast, over 50 miles away. The project involved the construction of a pipeline trestle over 6½ miles of swamp.

Netherlands New Guinea is a relatively new member of the world's oil producing countries—the first cargo of crude oil was exported in December, 1948—but exploration began in 1935 in the Vogelkop sector in the north-west of the island which is part of a concession area of 24,700,000 acres. After extensive aerial mapping which was necessary because of the inaccessibility of the region, the area was investigated by field geologists and geophysicists. In the West Vogelkop district oil was first struck in a test well at Klamono in October, 1936, whilst in the East Vogelkop the first productive wells were completed at Wasian in June, 1939, and at Mogoi in the middle of 1941. The operating company is the Nederlandsche Nieuw Guinee Petroleum Maatschappij, which is owned by N.V. De Bataafsche Petroleum Maatschappij (Royal Dutch/Shell Group), the Standard-Vacuum Oil Company and Far Pacific Investments Inc. in the proportion 40 per cent, 40 per cent and 20 per cent respectively.

During the war, operations were suspended, but in the course of the work undertaken after the war a 30-mile road and pipeline were constructed from the Klamono field—developed meanwhile—to an ocean terminal at Sorong to provide an outlet for Klamono's oil. This field is now producing 750 tons of crude oil daily. The next step was to provide an export outlet for oil from the Wasian and Mogoi oilfields, which are now producing at a joint rate of 1,300 tons daily, to a marine terminal on the river Muturi. This constituted a difficult problem because the route runs through the swampy territory of the river Muturi area and over the very uneven Tembuni range of hills.

A section of the 6½ miles of pipeline trestle crossing swampland

The first stage of the project involved the laying of 6 in. diameter pipelines from Wasian and Mogoi to a junction at Tembuni. Here were erected two storage tanks, each of 3,000 tnos capacity, and a pump house. From Tembuni an 8 in. diameter line, some 37 miles long, was laid to Muturi Hill (330 ft. high) where two further storage tanks, each of 22,000 tons capacity, were established. For the last ten miles from Muturi Hill to the terminal, a 24 in. diameter line was laid for gravity loading. The last stretch of coastal swamp (6½ miles long) had to be crossed by a specially constructed pipeline trestle.

METALS, MINERALS AND ALLOYS

Metal markets generally have been steadier this week reflecting lessening apprenhension in the United States of further recession. Sentiment among business people is described as highly confident, unemployment is declining and mid-term election campaigns are already busy. Important labour negotiations between the U.S. Steel Corporation and the C.I.O. Steel Workers are due to start in Pittsburgh next week and negotiations between Goodyear Tyre and the C.I.O. have already begun. Generally speaking at atmosphere of sweet reasonableness is believed to prevail on both sides and augurs well for negotiations in other leading industries.

How far these relations may be affected by what appears to be the abandonment of any legislation to amend the Taft-Hartley Act in the current session remains to be seen. The sending back by the Senate of the Labour Committee's draft bill for further study by that body drew from Senate Republican leader Mr. Knowland the statement "I think the action of the Democrats killed the legislation as far as this session is concerned"; and the Administration's party programme is widely thought to be "washed up." Generally speaking the metals are regarded as being in a strong position in the U.S. with stocks tending to decline.

COPPER.—Following on the decision of Kennecott to revert to a six-day week, sentiment in the United States has strengthened. Consumer demand is reported lively with the present rate of bookings for June delivery in excess for those for May. The export market was firm with nearby quotations around 30¼ c. and June tightening to 30 c. per lb.

Further evidence of growing optimism is suggested by the fact that the House Ways and Means Committee have approved a Bill to continue the suspension of the import duty on the metal for two years more, up to June, 1956. Giving evidence before the Committee, Mr. Ray G. Boyd, of the Department of Commerce, said that there was an insufficient supply of domestically produced refined copper to meet normal commercial needs. The duty would be restored should the average U.S. copper price for any calendar month fall below 24 c. per lb.

In Great Britain stocks of copper declined substantially in March according to the British Bureau of Non-Ferrous Metal statistics. At the end of March stocks had fallen to 47,258 tons compared with 60,040 a month earlier.

New transportation rates have been announced by the Rhodesian railways for copper exports from the Copperbelt mines. The rate has been increased to 1.152d. per ton mile as against 0.67d. previously. The railways and the copper companies have also agreed that the public rates for coal traffic shall apply to the copper mines while payment for goods imported via Beira would in future be at the public rate less 10 per cent but the maximum charge of £8 per ton will no longer apply.

Yugoslav production last year is reported as 31,190 tonnes of blister (32,819 in 1952) and 27,764 tonnes of electrolytic (21,390 in the previous year); exports fell from 17,999 tonnes to 14,716. When the copper rolling mills at Sevojno and the cable plant at Svetozarevo are completed domestic consumption should be about 44,000 tonnes.

LEAD.—While demand for both lead and zinc in the U.S. is described as fair, complaints are still heard that consumers are living on inventories pending definite developments in Washington regarding stockpiling and tariffs. Lead export demand is maintained with fair sales at 12¼-12½ c. per lb. f.a.s. Gulf ports. The chairman of the St. Joseph Lead Company said that the U.S. Government had indicated that it was alive to the plight of the U.S. miner, rendered more difficult by the devaluation of the Mexican peso, and he expected the Administration would take action either by stockpiling, restriction of imports, increased tariffs, or otherwise.

TIN.—The fall of Dien Bien Phu has not influenced the tin market which remains very steady with a slightly upward tendency.

Addressing the annual meeting of the Straits Trading Company in Singapore this week, Sir Ewen Ferguson stressed the importance of convertibility to Malayan smelters. It was, he said, disappointing to see Siamese ore supplies in transit through Malaya to other destinations for reasons which were primarily the acquisition of currency which was freer to deal in than sterling.

Indonesian production in April was 2,684 tons, making the total for the first four months of 1954 10,298 tons against 9,689 tons in the same period last year. Indonesian shipments of concentrates in March were equivalent to 1,111 tons of metal as against 2,605 in February; making shipments for the first quarter of the year 6,796 tons against 7,092 tons in the same period last year. The low shipment figure in March is thought to reflect a temporary halt in U.S. despatches before shipments begin of the recent purchase of 18,000-20,000 tons, to be delivered during the third and final year of the U.S. Indonesia contract.

ZINC.—For the first time in eleven months U.S. zinc stocks failed to show an increase, being reported at 200,808 s.tons as compared with 201,100 at the end of March—the figure a year ago was only 94,280 s.tons—so the magnitude of the deterioration is striking. Output of slab last month was 70,233 s.tons, slightly less than in March. Shipments showed little change from the previous month at 70,525 s.tons against 70,080.

A revised zinc futures contract will be introduced on the London Metal Exchange for deliveries on and after September 1, 1954. The contract is in line with the new contract for lead, introduced in February, and provides for trading in the first and second half of each month. Dealings for the first half of September commence on May 31. The purpose of the new contract is to speed up deliveries.

ALUMINIUM.—The Business and Defence Administration of the U.S. Commerce Department has announced that in the third quarter of the year 67,000 s.tons of aluminium will be allocated for the Defence Department and the Atomic Energy Commission. This is 16,000 tons less than the allocation for the second quarter and is due to a decrease in military requirements.

The recommendation of the Aluminium Smelters Industry advisory committee to embargo scrap exports which was referred to the aluminium scrap dealers and exporters last month, was negatived by them: they find that there is no shortage of scrap in the U.S. and that foreign demand is continuing to fall.

Production of aluminium in Yugoslavia should increase considerably in the near future. At Razine in Croatia an electrolytic plant having a capacity of 4,500 tonnes is nearing completion and a rolling mill with a capacity of 15,000 tonnes is also in hand. At Strnisce in Slovenia another electrolytic plant of 30,000 tonnes capacity is under construction.

MANGANESE.—The decline experienced in manganese quotations in recent months is said to be causing a crisis in Indian manganese mining. Mines producing second and third grade ores have drastically curtailed operations and first grade ore is more than 30 per cent lower than some six months ago. The demand from the U.S. which is the principal buyer of India's manganese ore has declined considerably, while the appearance of the U.S.S.R. as a supplier of Continental consumers has much increased competition.

NICKEL.—Mr. Thayer Lindsley at the annual meeting of the Falconbridge Nickel Mines said that the Kristiansand refinery was now being expanded to reach a rate of 22,500 s.tons of nickel yearly. Ultimately the company hopes to attain a total annual output of 30,000 s.tons.

Commenting on the price of nickel, Mr. Lindsley observed: "It seems evident that the prevailing market price for nickel does not afford sufficient incentive to provide new production to keep pace with demand. It is certainly not a satisfactory situation wherein the development of practically every new source of nickel has been coupled with a governmental contract involving financial assistance in one form or another. A fairly priced and abundant supply is undoubtedly the greatest incentive to steady growth in future consumption."

TUNGSTEN.—The Ministry of Materials again dropped its selling price sharply on Tuesday to 215s. per l.ton unit and again to-day to 195s. for delivery both for wolframite and

scheelite. Prices have also eased in New York to $27-28 per s.ton unit exclusive of import duty of $8.

The difficulties of Portuguese producers and shippers are referred to elsewhere in this issue.

PLATINUM.—Sales of the platinum group metals to U.S. consumers last year are computed by the Bureau of Mines at 22 per cent above those of 1952. Platinum improved 25 per cent, palladium 19 per cent, and iridium, osmium, rhodium and ruthenium some 22 per cent. Total imports of the group metals exceeded those of the previous year by 41 per cent and for the first time for six years Russian platinum made its appearance on the market.

Iron and Steel

Apart from minor setbacks in the light castings trade and the re-rolling industry, the market for iron and steel products is strong and healthy. Home demand continues at a very high level, and there has been a small expansion of exports notwithstanding the much keener competition which British producers have to face in their quest for foreign trade.

Confidence in the outlook is only qualified by the apprehension that an advance in prices may ultimately be found to be inevitable. Whether the steel industry can shoulder a rise of £4,500,000 in its annual coal bill without some corresponding increase in prices is a still unanswered query. The reluctance of the Iron and Steel Board to authorize an advance which would have immediate repercussions upon the shipbuilding and engineering industries is understandable, but the rise in steel makers' costs is an irrefutable fact.

Meanwhile consumers see no disadvantage in securing prompt supplies at present prices and business in most descriptions of iron and steel this week has been brisk. The need for the further expansion of pig iron production is clearly indicated. There has been a slight fall in stocks, foreign iron is still being imported, and preparations have been speeded up to bring additional blast furnace capacity into operation at the earliest possible moment.

Ingot production has at last overtaken the requirements of the rolling mills and it has become possible to dispense with the use of foreign steel semis which are now arriving only in small driblets. Billet requirements are on a very modest scale as the re-rolling mills are not fully employed, but the call for short bars and slabs has never been so heavy as it is at present. The sheet mills in fact are making a substantial contribution to the export trade. Further big shipments are due before the end of June, and subject to the grant of the necessary export quotas further bookings have been fixed for Period III.

Both on the North-East Coast and in South Wales there has also been achieved a remarkable expansion in the output of plates. It is reported that at Port Talbot the Steel Company of Wales has produced a record output of 30,706 tons of steel strip and plates in a single week. The result of these efforts is that the plate shortage has been overcome. Shipbuilders are well satisfied with their deliveries and progressive improvement is promised.

The London Metal Market

(From Our Metal Exchange Correspondent)

The tin market has been relatively active and a very small backwardation has been re-established; published U.K. stocks on Monday showed an increase of almost 200 tons. Demand in America seems to have tailed off a little, probably owing to more optimistic views on the Far Eastern situation, but these, however, can alter overnight. On Thursday morning the Eastern price was equivalent to £735 2s. 6d. per ton c.i.f. Europe.

The turnover on the lead market has remained very low, but, with interest being shown in the current month, prices rose last week-end; however with more metal becoming available the price is now tending to sink back again as consumer demand cannot be described as better than spasmodic.

The zinc market has been absolutely featureless with an extremely narrow movement in price. On the Continent more zinc has been on offer, and at times has been available for May delivery at as much as twenty shillings under the L.M.E. quotation for the current month.

The amount of copper available for cash and nearby delivery has increased, and with little interest being taken in the forward position the backwardation has tended to narrow. Consumer demand remains good both here and on the Continent, and in America the position for nearby metal is still extremely tight. The Chilean output is still being disposed of on a basis of 29 c. f.a.s., although there are signs that a part of the copper which has now been shipped has not yet found a home, and it seems possible that limited tonnages may be available at relatively low prices in the near future.

In general markets are suffering from the uncertain political outlook, which is resulting in optimistic consumers using up their stocks in the expectation of lower prices following a satisfactory outcome to the Geneva Conference. The pessimists, however, are not convinced that a breakdown in the talks would result in appreciably higher prices and are therefore not stocking up.

	May 6		May 13	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£710	£712½	£727½	£728
Three months	£710	£712½	£727	£727½
Settlement	£712½		£728	
Week's turnover	720 tons		800 tons	
Lead				
Current month	£93½	£93½	£94½	£95
Three months	£91½	£91½	£92½	£93½
Week's turnover	1,800 tons		1,725 tons	
Zinc				
Current month	£79⅞	£79⅞	£79½	£79⅝
Three months	£79	£79⅛	£79	£79⅛
Week's turnover	2,750 tons		3,550 tons	
Copper				
Cash	£244	£244½	£242	£242½
Three months	£237½	£238	£238	£238½
Settlement	£244½		£242½	
Week's turnover	6,550 tons		4,700 tons	

OTHER LONDON PRICES — MAY 13

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. .. £210 per ton
Crude (70%) .. .. .. £200 per ton
Ore (60% basis) .. .. .. 22s./24s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, 99.5%, £156 per ton
Bismuth (min. 4 cwt. lots) 16s. lb.
Cadmium (Empire), 13s. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 249s. 1d. f.oz.
Iridium, £52 10s. oz. nom.
Magnesium, 2s. 6d. lb.
Manganese Metal (96%-98%) £230/£262
Osmiridium, £40 oz. nom.
Osmium, £50 oz. nom.
Palladium, £7 10s. oz.
Platinum, £30/£31
Rhodium, £43 10s. oz.
Ruthenium, £23 oz.
Quicksilver, £85 ex-warehouse
Selenium, 35s. 9d. nom. per lb.
Silver 73d. f.oz. spot and 72⅞d. f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 65% 8s. 6d. lb. c.i.f.
60% 8s. 3d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 12s. per ton c.i.f.
" Refractory £13 4s. per ton c.i.f.
Magnesite, ground calcined .. £26-£27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. 102s. 4d.-103s. per unit c.i.f.
Wolfram (65%)* .. .. .. World buying 195s.-205s.
" " .. .. .. 195s. U.K. Selling inc. charges
Scheelite (65%)* .. .. .. World buying price nom.
" " .. .. .. 195s. U.K. Selling inc. charges
Tungsten Metal Powder (98% Min. W.) .. .. 18s. 9d. nom. per lb. (home)
Ferro-tungsten .. .. .. 15s. 9d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £53 10s. 0d. per ton
Manganese Ore Indian c.i.f. Europe (46%-48%) .. .. .. 6s. 8d. per unit
Brass Wire .. .. 2s. 6¾d. per lb. basis
Brass Tubes, solid drawn .. 1s. 11¼d. per lb. basis

* As from May 14

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Stock markets remained cheerful. Gilt-edged after encountering a check due to the issue of the new Birmingham loan and news of an impending issue by Trinidad boomed on Thursday following the announcement of the cut in the Bank Rate to 3 per cent.

Renewed interest in Kaffirs found the market short of stock and prices recovered sharply. Among finance houses, Johannesburg Consolidated advanced due to renewed interest in uranium shares in Johannesburg. African and European eased after the report and accounts. Shareholders have the option of taking up new shares in the company in the ratio of 3 for every 10 held at 45s. each. Dealings in the rights started as a premium of 1s. 6d. each.

Among individual mines, Van Dyk Consolidated Mines were unchanged after the chairman's statement. The announcement concerning the uranium outlook for Vogelstruisbult Gold Mining caused a decline in the shares. The sudden increase in demand for Western Reefs and Randfontein emanated from Johannesburg and caused a jump in price. Crown Mines fell; operations on the property can be expected to continue on the present scale for another three years, after which a gradual decline must be expected during the remaining life of the mine. Only a radical change in existing gold mining conditions can alter this prospect. Durban Deep have been granted mining rights over 750 claims adjoining the property. Development plans are expected to incur considerable capital expenditure. The shares eased on this news.

Much of the interest in Kaffirs was centred on the Orange Free State section. This was helped by one or two London brokers' circulars and buying in Johannesburg. Enquiry started in Free State Geduld and President Brand and from there spread to President Steyn and Ofsits. News that the St. Helena plant, designed to treat 80,000 tons a month, will in fact be capable of handling 100,000 tons a month was a bull point for that company's shares. Before long, it will be necessary to sink another vertical shaft on the property and also to plan for increased milling capacity. The improvement in Welkom was based on the interesting speculation that recent good developments from President Brand may continue into the Welkom property. In addition, the mine workings are thought to be approaching the area from which rich borehole results were obtained.

There was little doing in the West African market, but a rather steadier tendency was evident. There was some interest in Ariston, due to the mine's good record and apparent prospects for the future.

In the miscellaneous gold section, the feature was a sharp improvement in Zambesia Exploring Company. The fact that the new roaster plant at the Dalny mine is now in operation failed to affect the price of Falcon shares, although there is the prospect of improved production during the next few months.

Continental buying of De Beers lifted the price of the shares and other diamond issues advanced in sympathy.

Coppers were better despite higher freight charges and coal difficulties. The steadiness of the metal price and political trouble and inflation in Chile have no doubt helped. Buying of Bancroft was again in evidence and the shares rose to 15s. Gains were recorded by most of the popular issues in this section. Tanks rose on continental buying but Rhodesia Katangas again fell away to a new low level.

Tin shares were rather featureless although the metal price finished the week looking rather steadier. The higher dividend by London Tin surprised the market and the shares rose. Beralts fell on the lower wolfram price.

Lead/zinc shares were quiet, but Lake George fell due to disappointment with the poor April returns.

In the miscellaneous section, asbestos shares did well over the week and renewed interest was shown in manganese issues. There was some slight demand for South African Collieries on hopes of increased sales and production.

Canadians were better on the more bullish American market.

	Price May 12	+ or — on week
FINANCE		
African & European	2½	—1/16
Anglo American Corpn.	6½	+3/32
Anglo-French	19/6	.....
Anglo Transvaal Consol.	21/3	.....
Central Mining (£1 shrs.)	29/-	.....
Consolidated Goldfields	47/9	—4½d
Consol. Mines Selection	28/1½	.....
East Rand Consols	3/-	+3d
General Mining	3 3/16	.....
H.E. Prop	36/10½	+7½d
Henderson's Transvaal	7/6	.....
Johnnies	43/1½	+1/1½
Rand Mines	3½	+1/8
Rand Selection	31/10½	.....
Strathmore Consol.	30/-	.....
Union Corp. (2/6 units)	27/-	.....
Vereeniging Estates	4 7/16	.....
Writs	34/6	+1½d
West Wits	40/7½	—7½d
RAND GOLD		
Blyvoors	35/6	.....
Brakpan	9/-	.....
City Deep	15/9	+1½d
Consol. Main Reef	17/6	.....
Crown	38/9	—1/3
Daggas	3 7/16	.....
Doornfontein	24/3	+1/3
Durban Deep	35/-	—7½d
E. Daggas	12/3	—3d
E. Geduld .. (4/- units)	27/6	—6d
E. Rand Props	2⅜	+1/16
Geduld	3¼	.....
Govt. Areas	11/6	—3d
Grootvlei	19/6	—3d
Libanon	10/3	+3d
Luipaards Vlei	21/-	.....
Marievale	17/9	—3d
Modderfontein East	15/-	.....
New Kleinfontein	15/-	.....
New Pioneer	13/6	+1/-
Randfontein	61/6	+4/-
Robinson Deep	15/-	+6d
Rose Deep	14/6	+1½d
Simmer & Jack	4/-	—3d
S.A. Lands	20/7½	—7½d
Springs	4/-	.....
Stilfontein	26/6	+6d
Sub Nigel	39/4½	+7½d
Van Dyk	4/6	.....
Venterspost	12/3	+3d
Vlakfontein	15/6	+10½d
Vogelstruisbult	33/-	—9d
West Driefontein	5⅜	+3/16
W. Rand Consolidated	2½	+1/16
Western Reefs	50/7½	+4/4½
O.F.S.		
Freddies	6/-	+3d
Freddies N.	6/10½	+3d
Freddies S.	6/10½	+3d
F. S. Geduld	4 3/16	+1/8
Geoffries	13/4½	+4½d
Harmony	30/4½	—1½d
Loraine	10/10½	+10½d
Lydenburg Estates	15/6	+9d
Merriespruit	11/6	+3d
Middle Wits	13/1½	+3d
Ofsits	48/6	+2/6
President Brand	55/-	+3/9
President Steyn	30/-	+3/9
St. Helena	22/6	+1/9
Virginia Ord.	13/-	+3d
Welkom	18/6	+1/9
Western Holdings	3 1/16	—1/32
WEST AFRICAN GOLD		
Amalgamated Banket	1/5½	+½d
Ariston	5/7½	+3d
Ashanti	20/4½	—7½d
Bibiani	4/6	.....
Bremang	1/10½	.....
G.C. Main Reef	3/3	.....
G.C. Selection Trust	6/4½	+3d
Konongo	2/6	+1½d
Lyndhurst Deep	10½dXD	.....
Mariu	1/1½	+1½d
Taquah & Abosso	2/4½	.....
AUSTRALIAN GOLD		
Boulder Perseverance	2/9	.....
Gold Mines of Kalgoorlie	13/3	.....
Great Boulder Prop.	8/3	.....
Lake View and Star	13/9	—3d
Mount Morgan	17/9	.....
North Kalgurli	7/-	.....
Sons of Gwalia	5/-	.....
South Kalgurli	6/6	.....
Western Mining	11/4½	—1½d
MISCELLANEOUS GOLD		
Cam and Motor	8/9	—3d
Champion Reef	4/7½	+3d
Falcon Mines	7/4½	.....
Globe & Phoenix	21/6	.....
G.F. Rhodesian	5/3	+3d
London & Rhodesian	4/1½	+1½d
Motapa	1/7½	.....
Mysore	5/6	+6d
Nundydroog	5/7½	+1½d
Ooregum	3/3	—1½d
Oroville	17/6	+3d

	Price May 12	+ or — on week
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	18/3	—9d
Zams	36/-	+1/3
DIAMONDS & PLATINUM		
Anglo American Inv.	5½	+1/8
Casts	23/6	—3d
Cons. Diam. of S.W.A.	5	.....
De Beers Defd. Bearer	83/-	+3/-
De Beers Pfd. Bearer	16½	+½
Potgs Platinum	8/4½	+4½d
Watervaal	13/-	+3d
COPPER		
Chartered	73/-	+2/-
Esperanza	6/6	+1½d
Indian Copper	4/6	.....
Messina	3 1/16	+1/16
Nchanga	7 1/16	+1/16
Rhod. Anglo-American	53/9	+1/6
Rhod. Katanga	11/6	—1½d
Rhodesian Selection	16/4½	+7½d
Rhokana	21 1/16	+1/16
Rio Tinto	22½	.....
Roan Antelope	16/10½	+6d
Selection Trust	36/6	+1/6
Tanks	80/6	+3/-
Tharsis Sulphur Br.	2 1/16 XD	.....
TIN (Eastern)		
Ayer Hitam	25/3	—3d
Gopeng	8/1½	+1½d
Hongkong	6/9	—1½d
Ipoh	15/9	.....
Kamunting	8/-	+1½d
Kepong Dredging	4/6	—3d
Kinta Tin Mines	10/4½	.....
Malayan Dredging	26/3	.....
Pahang	11/-	—6d
Pengkalen	8/4½	—4½d
Petaling	7/10½ XD	—1½d
Rambutan	15/-	.....
Siamese Tin	7/3	.....
Southern Kinta	15/9	+3d
S. Malayan	24/6	+3d
S. Tronoh	10/6	—3d
Sungei Kinta	11/10½	.....
Tekka Taiping	6/-	—3d
Tronoh	23/-	+3d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	14/1½	—1½d
Beralt Tin	22/6	—3/-
Bisichi	5/9	.....
British Tin Inv.	14/7½	+1½d
Ex-Lands Nigeria	3/4½	.....
TIN (Nigerian and Miscellaneous) contd.		
Geevor Tin	4/10½	.....
Gold & Base Metal	3/3	.....
Jantar Nigeria	8/9	.....
Jos Tin Area	13/6	.....
Kaduna Prospectors	2/6	.....
Kaduna Syndicate	2/6	.....
London Tin	6/4½	+6d
United Tin	3/-	.....
SILVER, LEAD, ZINC		
Broken Hill South	46/9XD	.....
Burma Mines	2/3	.....
Consol. Zinc	31/3	.....
Lake George	7/-	—9d
Mount Isa	39/-	+3d
New Broken Hill	23/6	—10½d
North Broken Hill	2 1/16 XD	.....
Rhodesian Broken Hill	11/1½	+3d
San Francisco Mines	16/6	—6d
Uruwira	3/9	+3d
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	43/9	+3d
Associated Manganese	51/-	+1/7½
Cape Asbestos	26/3	—3d
C.P. Manganese	61/9	+3d
Consol. Murchison	39/3	+6d
Mashaba	4½	.....
Natal Navigation	3⅛	+1/16
Rhod. Monteleo	1/9	.....
Turner & Newall	83/3	+4/-
Wankie	13/6	.....
Witbank Colliery	3 1/16	.....
CANADIAN MINES		
Dome	$29½	.....
Hollinger	$27½	—½
Hudson Bay Mining	$81	+2
International Nickel	$71½	+½
Mining Corpn. of Canada	£4⅞	+⅛
Noranda	$124	+1
Quemont	£6⅞	+⅛
Yukon	4/-	.....
OIL		
Anglo-Iranian	11 9/16	+½
Apex	49/4½	.....
Attock	43/1½	.....
Burmah	80/7½	+2/7½
Canadian Eagle	32/6	.....
Mexican Eagle	18/4½	+3d
Shell (bearer)	6½XD	+3/16
Trinidad Leasehold	24/-	+2/4½
T.P.D.	25/3	—6d
Ultramar	28/9	—6d

COMPANY NEWS AND VIEWS

Central Mining's Strong Finances

The full report and accounts of the Central Mining and Investment Corporation have now been published. Gold mining is, of course, by far the most important interest of the Corporation and apart from the twelve producing mines under the direct administration of the Central Mining-Rand Mines organization, other investments in gold mining companies extend the spread from the Rand and West Wits Line to the O.F.S. Apart from gold mines, however, a substantial participation is held in the oil, coal and base metal industries; while other interests include sundry industrial and commercial undertakings, land and property.

Group profits achieved in 1953 have shown a striking increase of £427,920 over those attained in the preceding year mainly due to profits from the realization of shares and sales of subsidiary interests. A decrease in dividend income from the previous year's level was recorded and this must reflect the "reduced profitability of the S.A. dividend-paying gold mines of the group."

A striking and colourful presentation showing the distribution of revenue from an ounce of gold, has this year replaced the more sombre graph in reports and accounts of recent years. It is forcefully demonstrated by these diagrams how, in spite of the impetus to the industry which was the outcome of devaluation in 1949, costs have since continued their relentless advance and now take three quarters of revenue, or virtually the same as in the year before devaluation.

How much this is due to the great number of mines at present in the unprofitable pre-production stage is not known, but this may perhaps become evident in the future when more economic operations commence.

Group balance sheet figures disclose a strong financial position. Investments shown at £8,730,393 have a market value of £14,111,265 and current assets exceed liabilities by £2,182,215. Group capital employed shown at £10,992,080 does not include investments at market value and when this difference amounting to £5,380,872 is added and preference capital deducted an actual valuation is shown to be over two and a half times the present market price of 29s. An unusually prudent financial policy is disclosed by the £14,504,681 set aside in gilt-edged securities; an amount which is almost as large as the £16,028,044 held on deposit from associated companies. Cash balances stand at over £800,000.

It is true that the Corporation in recent years has been turning its attention towards fields of investment other than gold but opportunities for profitable gold investment have not been overlooked: Harmony, the promising new O.F.S. mine, is being brought to production under the ægis of the Corporation, and in addition a substantial stake is held in the West Wits producer, Blyvooruitzicht. Investments on the Rand, moreover, although perhaps old by O.F.S. standards, have a good number of years to go yet, and meanwhile provide constantly satisfactory dividends and stand to benefit considerably from any continued improvement in the labour situation.

It seems strange, therefore, that the generous yield of 8½ per cent can be obtained on the shares of this well-founded company whose dividend record has shown so steady a record of increases. At 29s. the shares stand well below last year's high of 41s. 10d. and appear worthy of attention.

A. and E.'s Increased Revenue

African and European Investment Co. Ltd. has an interesting spread of investments which are predominately confined to gold in the O.F.S. and South African coal mining. In recent years, however, the company has considerably broadened the spread of its portfolio and its present interests extend to asbestos mining, steel, real estate and brick and tile production. The company also has substantial farming interests. The report and accounts for the year ended December 31, 1953, includes for the first time three subsidiaries: Carolina Coal Mining Co., Cobra Emeralds Ltd., and Direct Construction Companies (Natal) and (O.F.S.) Ltd. Gold interests which mainly comprise a very considerable stake in the O.F.S. include Welkom, Presidents Brand and Steyn and Loraine, while the principal coal interests are held through Vereeniging Estates Ltd., an associated company. They include Amalgamated Collieries of S.A., Blesbok Collieries, Coronation Collieries, New Largo Colliery and Vierfontein Colliery. The company also has a large holding in Natal Anthracite Colliery. Other investments include Rhodesia Monteleo Asbestos, Union Steel Corporation, and Vereeniging Brick and Tile Co.

Considerable revenue is derived from dividends, revenue from farms, rents, royalties, underwriting commissions and share dealing. Revenue for the year 1953 increased from £1,080,423 to £1,118,599 and a dividend of 2s. 6d.—the same as for 1952—was declared on the ordinary capital of £1,300,000. Quoted investments shown on the balance sheet at cost of £6,974,605 had a value as at December 31, 1953, of £11,580,630.

Year to Dec. 31	*Dividend Income*	*Share Dealing*	*Other Income*	*Dividends*	*To Reserve*	*Carry Forward*
	£	£	£	£	£	£
1953	513,573	395,170	209,856	430,000	300,000	254,831
1952	430,223	403,511	246,689	430,000	250,000	229,038

At the present market price a return of over 5 per cent can be obtained on the shares of this important investment company which, in view of its maturing O.F.S. holdings, from which dividends may be expected in the near future, does not appear excessive. Moreover, the issue of 1,580,000 new ordinary shares which will increase the issued ordinary capital to £2,090,000 will ease present financial difficulties considerably. The proceeds of the issue will be used to cancel the present note issue and repay outstanding loans of £3,700,000.

Writ's Swiss Loan

In a circular accompanying the annual report of West Rand Investment Trust Ltd., it is reported that the Union Bank of Switzerland has provisionally agreed to advance the company 25,000,000 Swiss francs (£2,040,000) carrying interest at the rate of 4½ per cent per annum. As evidence of the new loan 25,000 registered bonds of 1,000 Swiss francs (S.A. £81 12s. 7d.) will be issued which will carry the right of conversion into 10s. Ordinary shares at an equivalent of 50s. per share until July 1, 1958, and 55s. until July 31, 1962. The report and accounts of "Writs" to December 31, 1953, show substantially increased net profits, after tax, of £771,837 compared with £514,095 in the previous year. Dividends paid amounted to 1s. 6d. per share (1s. 4½d.).

Amalgamated Banket Areas Maintain Dividend

An advanced profit statement issued by Amalgamated Banket Areas, the West African gold producer, for the year ended September 30, 1953, has recommended the payment of a dividend of 5 per cent, the same as was paid in the preceding year.

Trading profits for the year declined from £323,625 to £274,646. Outgoings were heavy. Care and maintenance expenditure at Fanti Mine written off was higher at £89,447 against £70,827, while ore development redemption took £120,666 against £86,775. On the other hand, provision for depreciation was lower at £50,000 compared with £97,030, and after meeting the dividend distribution of 5 per cent, less tax, which required £79,335 (£75,729) and writing off £131 (£111) from its subsidiary company's current account, the balance carried forward was down to £128,020 compared with £196,559 brought in.

The dividend will be payable to those registered by June 23. Meeting, London, June 22. Major General W. W. Richards is chairman.

West Africans in March

Our usual monthly table of 10 of the leading West African gold producers appears below.

	March, 1954			*M'ths since year end*	*Current Financial Year Total to date*			*Last Financial Year Total to date*		
Company	*Tons* (000)	*Yield* (oz.)	*Profit* (£000)		*Tons* (000)	*Yield* (oz.)	*Profit* (£000)	*Tons* (000)	*Yield* (oz.)	*Profit* (£000)
A.B.A.	68·9	11,122	11·0	6	400·8	64,634	81·1	358·9	54,371	110·1
Ariston Gold	33·3	11,220	54·2	6	189·7	61,687	272·9	175·5	61,028	303·1
Ashanti	25·0	16,242	64·5	6	145·0	93,165	376·0	135·5	89,500	465·0
Bibiani (1927)	30·0	6,300	10·1	6	153·1	37,705	43·2	182·0	36,696	76·2
Bremang*	363·5	1,546	L 6·3	3	986·2	4,021	L 18·1	1827·6	8,743	38·1
G.C.M.R.	10·1	4,351	16·3	9	73·3	34,114	106·9	77·6	29,712	92·3
Konongo	2·9	3,142	16·3	6	16·2	16,379	81·5	13·8	13,272	61·4
Lyndhurst D'p	1·0	1,079	5·3	6	5·9	7,025	33·6	6·1	6,476	31·6
Marlu Gold	35·1	3,250	5·4	6	234·4	23,426	80·7	248·5	24,831	79·2
T. & Abosso	27·2	6,129	5·0	12	306·5	63,080	106·9	274·0	64,438	L 4·0

* Cu. yd. dredged L indicates a loss

As the basis of calculating monthly profits varies from company to company, a direct comparison one with another is not possible. The basis for any one company has, however, remained consistent unless otherwise indicated.

Increased Sales by Mufulira and Roan

Considerable increases in copper sales by both Mufulira and Roan during the March quarter would indicate that headway is now being made in establishing "pipe-lines" to consumers in the U.K. and U.S.A. This became necessary following the resumption of free dealings on the London Metal Exchange in August last year, and excess stocks of both companies are expected to be converted into deliveries by the end of their financial years on June 30 next.

Nine months' operations at Mufulira disclosed that sales so far are almost the same at 52,069 l.tons as for the corresponding period last year. Revenue, however, is down by £936,000 at £11,913,000 while there has been an increase of £1,340,000 in costs. However, due mainly to a smaller replacements provision, profit before tax at £5,094,000 shows only a moderate decline from last year's figure.

At Roan, however, the nine months' figures show a drop in sales of 8,385 l.tons at 52,464 l.tons and in revenue £2,927,000 to £12,025,000. Costs have increased by £1,516,000 to £8,211,000 and although there has been a sizeable reduction in stocks, these still stand at the very high figure of £1,736,000 against £359,000 last year. Despite a decrease of £1,679,000 for replacements provision, profit before tax is down £1,394,000 at £4,979,000.

Due to the serious coal shortage on the Copperbelt, Mufulira has had to cut underground development; full production will, however still be continued. On the other hand, at Roan, where coal stocks are dwindling, cuts in production will have to be considered if supplies do not soon increase.

	June Qtr.	*Sept. Qtr.*	*Dec. Qtr.*	*Mar. Qtr.*
Mufulira	*(l.tons)*	*(l.tons)*	*(l.tons)*	*(l.tons)*
Sales	20,663	10,272	18,133	23,664
	(£000)	(£000)	(£000)	(£000)
Revenue	5,339	2,527	4,079	5,307
Costs	2,535	2,000	2,875	2,061
Difference in value of copper stocks	Cr. 174	Cr. 752	Cr. 732	Dr. 735
Surplus	2,978	1,279	1,936	2,511
London Expenses ...	3	Nil	Nil	Nil
Replacement* ...	250	205	216	211
Profit before taxation†	2,725	1,074	1,720	2,300
Roan Antelope	*(l.tons)*	*(l.tons)*	*(l.tons)*	*(l.tons)*
Sales	26,458	12,971	14,749	24,744
	(£000)	(£000)	(£000)	(£000)
Revenue	6,754	3,152	3,337	5,536
Costs	2,989	2,638	2,866	2,707
Difference in value of copper stocks	Cr. 43	Cr. 1,054	Cr. 1,010	Dr. 328
Surplus	3,808	1,568	1,481	2,501
London Expenses ...	Cr. 16	Nil	Nil	Nil
Replacements* ...	250	183	198	190
Profit before taxation†	3,574	1,385	1,283	2,311

* Subject to revision when year's accounts considered.
† Estimated.

Messina's New Copper Mine

The 50-year-old Umkondo Mine, which is in the Sabi Valley, has an area of approximately 100 sq. miles, and was first pegged in 1903 under the names of the Sabi and Bradley's plot. In the interim period the mine was worked only in 1919 and in 1920 during which time a total of 72 tons of copper was produced.

Messina (Transvaal) Development Company took the option on the mine a few months ago and it is understood that enough copper has already been found to "start up in a small way" with the possibility of further development depending on the amount of the copper deposit. Because of its extreme inaccessibility (it is 150 miles to the nearest town, Fort Victoria), and the comparatively low price of copper at the time, it was not mined before the war. However, the company now intend to transport the ore from the mine to Messina by lorry for smelting.

Inco Earns More in March Quarter

The March quarterly return for International Nickel Co. of Canada Ltd. disclosed that earnings on the common shares have risen to $1.06 compared with 82 c. in the previous quarter. A report issued in respect of the company's and its subsidiaries' operations for the quarter shows net earnings in terms of U.S. currency of $16,046,937 ($12,441,846) after all charges, depreciation, taxes, etc.

London Tin Again Pays More

An interim dividend of 24 per cent, compared with 22 per cent previously, has been declared by the directors of the London Tin Corporation in respect of the year ended April 30, 1954. As for last year no final dividend will be paid. Profits for the year, after providing £718,000 (£910,000) for taxation, have again increased and are considered to be in the neighbourhood of £480,000 (£448,893). It is hoped to hold the Corporation's annual meeting in September.

Burmah Oil Pays 2½ Per Cent More

An advanced profit statement issued by the Burmah Oil Company, giving the financial results achieved for the year 1953, announced the recommendation of a final dividend of 15 per cent, equivalent to 3s. per £1 unit on the ordinary stock, making, with the interim dividend of 2 per cent already paid, a total distribution for the year of 17½ per cent compared with 15 per cent in 1952.

Year to Dec. 31	*Group Profit*	*Taxation*	*Net Profit*	*Dividend*	*To Reserves*	*Carry Forward*
	£	£	£	%	£	£
1953	7,677,116	4,424,792	3,252,324	17½	1,100,000	596,411
1952	7,613,260	4,741,422	2,871,838	15	1,018,257	596,047

The dividend distribution on the ordinary stock absorbed £1,983,210 (£1,687,015), and a further amount of £168,750 was taken to service the preference dividends.

The final dividend will be paid on July 2 to those registered as at May 6. Meeting, June 11.

Inco Board Changes.—Mr. Ralph D. Parker has been elected general manager of Canadian Operations of the International Nickel Company of Canada. Mr. Walter C. Kerrigan has been elected assistant to the recently appointed president, Mr. Henry S. Wingate. Mr. Herbert Fales, in addition to continuing in his existing post as vice-president of Inco and vice-president of its U.S. subsidiary, has been appointed assistant to Dr. John F. Thompson, chairman of the board for both companies. Mr. F. M. A. Nablet has been elected treasurer of the parent company and its U.S. subsidiary.

Sir Henry Wilson Smith has been appointed deputy chairman of Powell Duffryn Ltd.

WILFLEY

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AFRICAN AND EUROPEAN INVESTMENT COMPANY

(Incorporated in the Union of South Africa)

MR. R. B. HAGART'S REVIEW

The forty-ninth Annual General Meeting of African and European Investment Company Limited will be held in Johannesburg on June 18, 1954.

The following are extracts from the Statement by the Chairman, **Mr. R. B. Hagart,** circulated with the Annual Report and Accounts for the year ended December 31, 1953:—

ACCOUNTS

The profit earned during the year ended December 31, 1953, was £855,194 as compared with £929,344 in 1952 and £856,531 in 1951. Taxation provision amounted to £126,000 and Directors' additional remuneration to £5,000.

A sum of £11,764 expended on prospecting operations was written off and provision was made for a loss of £8,514 incurred by a subsidiary company.

The General Reserve was improved to £3,350,000 by the transfer of £300,000 and dividends of 6 per cent on the Preference Capital and 2s. 6d. per Stock Unit on the Ordinary Capital were maintained, absorbing £430,000.

The Balance Sheet shows Reserves and Unappropriated Profits amounting to £3,585,622.

NEW ORDINARY SHARE ISSUES

As a result of favourable share market conditions the financial position of the Company has improved materially since the end of 1953 and available funds are now adequate for carrying out the investment policy of the Company and for normal operating purposes. In these circumstances your Board had to consider financial needs only in relation to monies borrowed by the Company in the form of £1,700,000 4½ per cent Notes and the loan of £2,000,000. It is clear that these funds are required for permanent investment in the business of the Company and your Board decided that immediate steps should be taken to raise new capital for the repayment of the whole of the indebtedness.

Accordingly, Stockholders were advised by circular dated April 12, 1954, that they were to be offered subscription rights for 780,000 new Ordinary Shares in the Company at 45s. per share in the ratio of three new Ordinary Shares for every ten Stock Units held, and that the Board had accepted an offer by the Anglo American Corporation of South Africa, Limited, to subscribe for 800,000 new Ordinary Shares at 50s. per share.

The proceeds of these issues will enable the Company to discharge the whole of the Note and Loan liabilities amounting to £3,700,000.

ORANGE FREE STATE INTERESTS

Your Company has a very considerable stake in the Orange Free State goldfield, particularly in Welkom Gold Mining Company Limited, President Steyn Gold Mining Company Limited and President Brand Gold Mining Company Limited.

The progress of these companies over the last twelve months, especially President Steyn and President Brand, has been more than encouraging and the Company can look forward with confidence to a satisfactory dividend income from these sources in the future.

WELKOM GOLD MINING COMPANY LIMITED

Gold production during the year 1953 totalled 148,540 oz. as against 106,116 oz. in 1952 and revenue from sales of gold increased from £1,350,092 to £1,860,745.

The working profit was £146,882 and the debit balance on the Appropriation Account was reduced from £207,487 to £94,653 at the end of 1953. In arriving at the working profit a proportion of general mine expenses and the cost of excess development, totalling in all £325,418, and a sum of £182,611 being interest charges on loans raised to finance capital expenditure (other than on the uranium project) were charged to Capital Account.

At the end of the year payable ore reserves amounted to 1,305,500 tons with an average assay value of 4.99 dwt. over a stoping width of 49.3 in.

So far as the Welkom Mine is concerned, the uranium content in ore reserves and in current development does not at present justify any residual slimes from the Mine's reduction plant being fed to the uranium plant for direct leaching. When the plant comes into operation it will, for the time being, treat slimes from other companies.

PRESIDENT STEYN GOLD MINING COMPANY LIMITED

Gold production was officially commenced at the beginning of April, 1954.

Underground development results on this property have been uniformly better than borehole indications and the high percentage of payability in reef exposures at both shafts is encouraging.

Up to the end of March, 1954, the results of development on Basal Reef were, in total:—

Footage on reef 19,542 ft.
Footage sampled 19,230 ft.
Footage payable 16,375 ft.
Percentage payable 85.15 per cent.
Average value of payable footage 541 in.-dwt.

From the available data it may be assumed that the payable ore developed (but not necessarily immediately available for stoping) is of the order of 900,000 tons with an average value of 7.00 dwt. over a stoping width of 49 in.

Good progress has been made in the construction of the uranium plant on the property and it is expected that the plant will be ready towards the end of 1954.

PRESIDENT BRAND GOLD MINING COMPANY LIMITED

During 1953 and the first quarter of 1954 development results on this mine have been very encouraging. Of 4,250 ft. sampled to December 31, 1953, 4,170 ft., or 98.12 per cent, proved payable, averaging 111.32 dwt. over 13.10 in., equal to 1,458 in.-dwt. In further development over the first quarter of the current year high values have continued with much the same degree of consistency. 3,140 ft. were sampled and averaged 98.57 per cent payable at an average value of 136.97 dwt. over 11.89 in. equal to 1,629 in.-dwt.

Subject to the development programme continuing according to schedule, the mine should reach production stage on a small scale before the end of 1954.

Residual slimes from the gold reduction plant will in due course be sent to one of the uranium treatment plants on either the President Steyn or the Welkom properties.

COAL INTERESTS

The principal bituminous coal producers in which we are directly or indirectly interested include:—

Amalgamated Collieries of South Africa Limited, Blesbok Colliery Limited, The Coronation Collieries Limited, Natal Coal Exploration Company Limited, The Newcastle-Platberg Colliery Limited, New Largo Colliery Limited, South African Coal Estates (Witbank) Limited, Springbok Colliery Limited, Vierfontein Colliery (Proprietary) Limited, Vryheid Coronation Limited.

In the anthracite field we have a large holding in Natal Anthracite Colliery Limited, which company is developing a steady inland and export business.

ASBESTOS

The asbestos market has suffered a severe recession in both price and volume and there are no signs yet of any favourable turn. Most South African and Southern Rhodesian producers, other than long-established concerns which have built up parallel end-user connections, are struggling and some of them may not survive.

Royalties received from Amosa Limited, a subsidiary of Cape Asbestos Limited, on amosite mined on certain of the Company's farms in the Lydenburg district, were satisfactory in 1953 but were considerably lower than the 1952 figure. Other asbestos interests include Munnik Myburgh Chrysotile Asbestos Limited, which is experiencing great difficulties, and Rhodesia Monteleo Asbestos Limited, which suspended operations in November last.

The total turnover from farm produce for the year amounted to £109,616, on which profits of some £17,500 were made. The outlook for the 1953/54 season is very good.

The Company will celebrate its 50th Anniversary this year. It has had an eventful but, on the whole, successful history and your Board believes that there is reason to be optimistic about the future.

Copies of the Annual Report and Accounts may be obtained from the London office of the Company, 11 Old Jewry, E.C.2.

DIVIDENDS

American Smelting 50 c.
Bank of British West Africa 7%
Blackwood Hodge (Holdings) 15%
Broken Hill South 60% *i*
Chicago Gaika Development 10%
Pengkalen Pref. Ord. 15% *i*; Ord. 5% (May 14)
Surprise Mining and Finance 12½%
Trinidad Central Oilfields 30%

i interim

PRODUCT DEVELOPMENT and ALMINAL EXTRUSIONS

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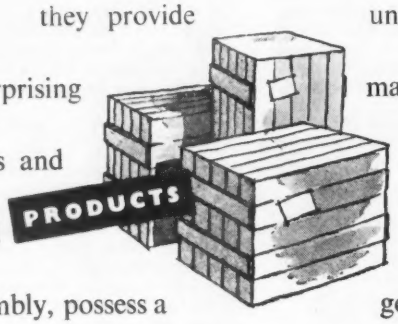

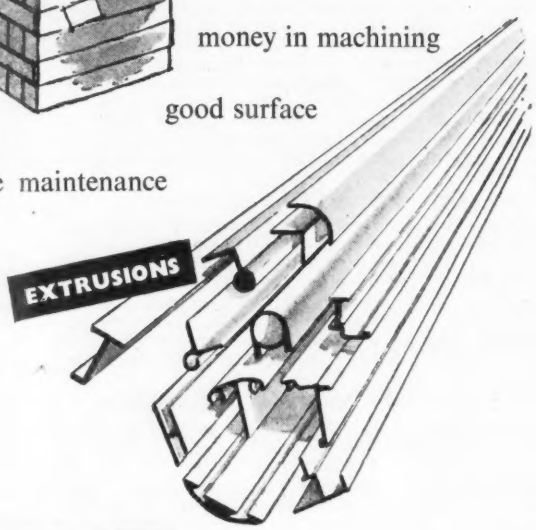

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GOLD COAST SELECTION TRUST

The twenty-fourth annual general meeting of Gold Coast Selection Trust, Ltd., was held on May 6 in London.

Major General W. W. Richards, C.B., C.B.E., M.C., chairman, presided.

The following is an extract from his statement circulated with the report and accounts for the year ended September 30, 1953:—

I think shareholders will agree that we have had another successful year. Income from dividends amounted to £106,753. Profit on the sale of investments, £3,715. The result of the year's operations, including the surplus on the purchase and sale of leases, showed a profit of £140,524.

In November the directors declared an interim dividend of 15 per cent, less tax, an increase of 2½ per cent on the previous year.

Our portfolio of investments is mainly represented by shares in mining companies operating in West Africa, including Amalgamated Banket Areas, Ariston Gold Mines, Bremang Gold Dredging, Gold Coast Main Reef, Marlu Gold Mining and Ankobra River Power. The market valuation at September 30, 1953, was £1,034,912, which shows an appreciation of £41,578 over the book value.

TIN, COLUMBITE, ETC.

Practically the whole of the world output of columbite is mined in Nigeria. The limited supply of this material caused a bonus price to be paid for columbite, raising it to over £2,000 per short ton. Of the companies in which we are interested, The Bisichi Tin Company (Nigeria), Gold and Base Metal Mines of Nigeria, and United Tin Areas of Nigeria, produce columbite, which is yielding very satisfactory profits. These companies have contracted forward to sell all their columbite production up to the end of 1956, at prices quoted above.

Development programmes are progressing well and the 1954 output should show considerable increases over the 1953 figures.

The report and accounts were adopted and the change of name to Western Selection and Development Company Limited was approved.

The chairman announced the payment of an interim dividend of 7½ per cent, less tax, on account of the financial year ending September 30, 1954, payable May 31.

MARLU GOLD MINING AREAS

The nineteenth annual general meeting of Marlu Gold Mining Areas, Ltd., was held on May 6, in London.

Major General W. W. Richards, C.B., C.B.E., M.C., chairman of the Company, presided.

The following is an extract from his Statement circulated with the report and accounts for the year ended September 30, 1953:—

From the financial point of view the year's operations were satisfactory. Gold production yielded £641,266, the highest since recommencement of operations after the war.

The net profit for the year was £124,551 which, added to the amount of £57,425 brought forward from previous years, gives a total of £181,976 to the credit of Profit and Loss Account. Due to past losses there is no liability in these accounts for tax other than income tax on Dividends and Interest received. The Directors recommend a distribution of five per cent, less tax, which will absorb £55,000 and leave a credit balance of £125,799 to be carried forward.

The total tonnage milled was 498,500, of which 18,500 tons was taken from the Sulphide (Underground) Section of the properties. The recovery was 49,421 oz. gold, equal to 1.989 dwt. per ton. Working costs were 18s. 11d. per ton.

The diminution of the Ore Reserves and the fact that there is very little prospect of finding on our existing properties any additional payable deposits is naturally causing your Board concern; but it is our intention to continue operations until all profitable gold has been mined from the properties.

The underground workings have caused the Management much concern. The structure of the ground plus the deleterious nature of the ore have forced the Engineers to revise their estimates and scale down the Ore Reserves which can be mined at a profit. In point of fact, it is extremely doubtful whether we will be able to profitably mine any ore from below the first level.

For the six months since the close of the financial year under review, a total tonnage of 234,240 has been mined and treated for a recovery of 23,416 oz. of gold and a Mine Working Profit of £77,780.

The report and accounts were adopted and the Dividend payment was approved.

KONONGO GOLD MINES

IMPROVED ORE RESERVES

The twentietth annual general meeting of Konongo Gold Mines, Ltd., was held on May 11 in London.

Mr. Robert Annan, M.I.M.M., chairman of the company, presided.

The chairman in the course of his speech said: The accounts for the year ended September 30, 1953, show a working profit of £154,406, an increase of £11,915 compared with the previous year. In spite of increases in taxation and depreciation and also a loss on the sale of South African Government Securities, the net profit of £35,203 is up by £6,486 on the figure for the previous financial year.

Your directors recommend the payment of a dividend of 10 per cent, less tax, which will absorb £34,059 leaving unappropriated profits of £56,657 to be carried forward.

The proved ore reserves show an increase of 48,290 tons over those of the previous year and because of the improved position, production is being stepped up to approximately 3,000 tons per month. In view of the current profit being earned at the increased sale of operations your directors have declared an interim dividend of 5 per cent in respect of the current financial year. At this stage, I would like to make it clear that although our mill is capable of crushing some 10,000 tons per month, since we changed over from flotation to direct cyanidation of the higher grade of ore now available, the capacity of our treatment plant on the basis is only 4,000 tons of ore per month and of this figure approximately 1,000 tons per month are treated for the account of Lyndhurst Deep-Level (Gold and Silver) Ltd.

DEVELOPMENT WORK

Development work continued in the three main sections of the mine, a total of 4,639 ft. being driven compared with 3,219 ft. in the previous year.

On the Odumase Reef the diamond drilling programme to test the reef below the 20th horizon was completed. The three holes drilled established the fact that the fissure persisted in depth but no payable values were found and work in this area has now been stopped.

15 North Drive Odumase was restarted in order to explore the ground between the Odumase and Boabedroo orebodies and to cover the downward projection of the latter oreshoot at this elevation. The drive has been advanced on fissure, and except for one short stretch of 40 ft., which averaged 13.5 dwt. per ton over 54 in., no values have yet been disclosed.

A distance of approximately 210 ft. remains to be driven before reaching the projected position of a possible extension in depth of the Boebedroo pay shoot.

On the Zongo reef driving has commenced on the 10th level where to date 100 ft. have been advanced, of which 85 ft. have proved payable, averaging 7.5 dwt. per ton over 64 in.

Work on No. 15 South Drive was resumed to test this pay shoot at depth and it is now 198 ft. short of the vertical projection of the winze from 9 to 10 level. It appears, however, that the ore shoot may have a south-westerly pitch and in consequence the drive may have to be extended a little further than originally anticipated.

At Boebedroo on the 11th level two parallel reefs were found giving a combined value of 14.4 dwt. per ton over 76 in. for a distance of 485 ft., while on 12 level, where the horizontal distance between the two reefs was a little greater, the total lengths of the two reef exposures together amounted to 505 ft. averaging 9.2 dwt./ton over 67 in.

A comparison of the values and lengths of this ore shoot as proved on levels 9 to 12 is as follows:—

Level	*Ft.*	*Dwt. per ton*	*In.*
No. 9	380	averaging 23.7 over	58
No. 10	523	„ 17.5 „	122
No. 11	485	„ 14.4 „	76
No. 12	505	„ 9.2 „	67

Whereas the increased length of the shoot, as disclosed on the 10th horizon, has been reasonably maintained on the levels below when aggregating the length of the two reefs, it is disappointing to note that the values are showing a decreasing trend.

A winze is now being sunk from the 12th to the 13th level on the hanging wall section of the reef, but has so far proved unpayable. This, of course, does not necessarily indicate unpayable ground in this section of the reef on the 13th level, and the possibilities of the extension in depth of the pay shoot must await the opening of the 13th level and the exploration on the 15th horizon by the drive from 15 level Odumase.

The report and accounts were adopted.

CONSOLIDATED MURCHISON (TRANSVAAL) GOLDFIELDS AND DEVELOPMENT COMPANY, LIMITED

(Incorporated in the Union of South Africa)

Directors' Report for the Quarter ended March 31, 1954

The following is the Report on the work done during the quarter ended March 31, 1954.

Tons crushed **15,248**
Estimated Profit from Antimony and Gold **£141,865**

Sales of Antimony were effected during the quarter.

Taxation for the three months ended March 31, 1954, in respect of total profits for this period amounting to **£141,865** is estimated at **£43,000.**

Revenue of **£5** in addition to the above was received during the quarter from sales of gold for manufacturing purposes.

The Capital Expenditure less recoupments during the period amounted to **£943.**

During the quarter no development was carried out.

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GOLD COAST

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Qualifications. Candidates must have had not less than five years' experience of water well drilling with percussion and rotary rigs, must be able to install deep well pumping plant, and must be capable of carrying out field repairs to the drilling plant and of dressing their own tools. Preference will be given to candidates who have been apprenticed in mechanical engineering.

Terms of Service. The appointment will be on contract/gratuity terms for one tour of 18 months with a possible extension to two tours. Salary will be in the range £1,000-£1,500 per annum (consolidated) according to age, qualifications and experience. A gratuity at the rate of £37 10s. for each completed three months of satisfactory service will be payable on final termination of the contract.

Free passages on first appointment and on leave will be provided for the officer and his wife once each way during each tour of service. The officer will normally be required to travel by air. Free air passages will also be provided for a maximum of three children under 13 years of age.

Vacation leave with pay; seven days for each month of service. Free medical and dental attention provided for officer and family. Furnished quarters available at low rental. Income tax at local rates. Kit allowance on first appointment £30-£60 according to salary.

This post is a "Development Post" for implementation of specific prospects under the Gold Coast Development Plan and is strictly temporary. On termination of the contract, the officer would not be eligible for transfer to any other Government appointment but would be able to apply for appointment to another post, if desired.

Candidates should apply to the Adviser on Recruitment, Gold Coast Office, Melbourne House, Aldwych, London, W.C.2, giving details of age, qualifications and experience and sending copies of recent testimonials if available.

FIELD GEOLOGIST. Australian company has a vacancy for a fully qualified Geologist. The duties will include the supervision of prospecting parties and will involve periods of camp life in sub-tropical areas. The successful applicant must have had a University training together with some field experience. Excellent salary and prospects. The cost of passage to Australia will be defrayed by the company. Applications should include details of training and experience and copies of recent testimonials. Box No. 552, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2.

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PLANT ENGINEER. A vacancy exists for a highly qualified mechanical engineer with construction experience to supervise installation of heavy equipment and civil works in tropical Africa. Top salary will be paid to attract an engineer with experience and initiative and applications will be treated in confidence. Please give full details of experience with application and an indication of salary expected to Box No. 551, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2.

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